

Practical remarks on gout, rheumatic fever, and chronic rheumatism of the joints : being the substance of the Croonian Lectures for the present year, delivered at the College of Physicians / by Robert Bentley Todd.

Contributors

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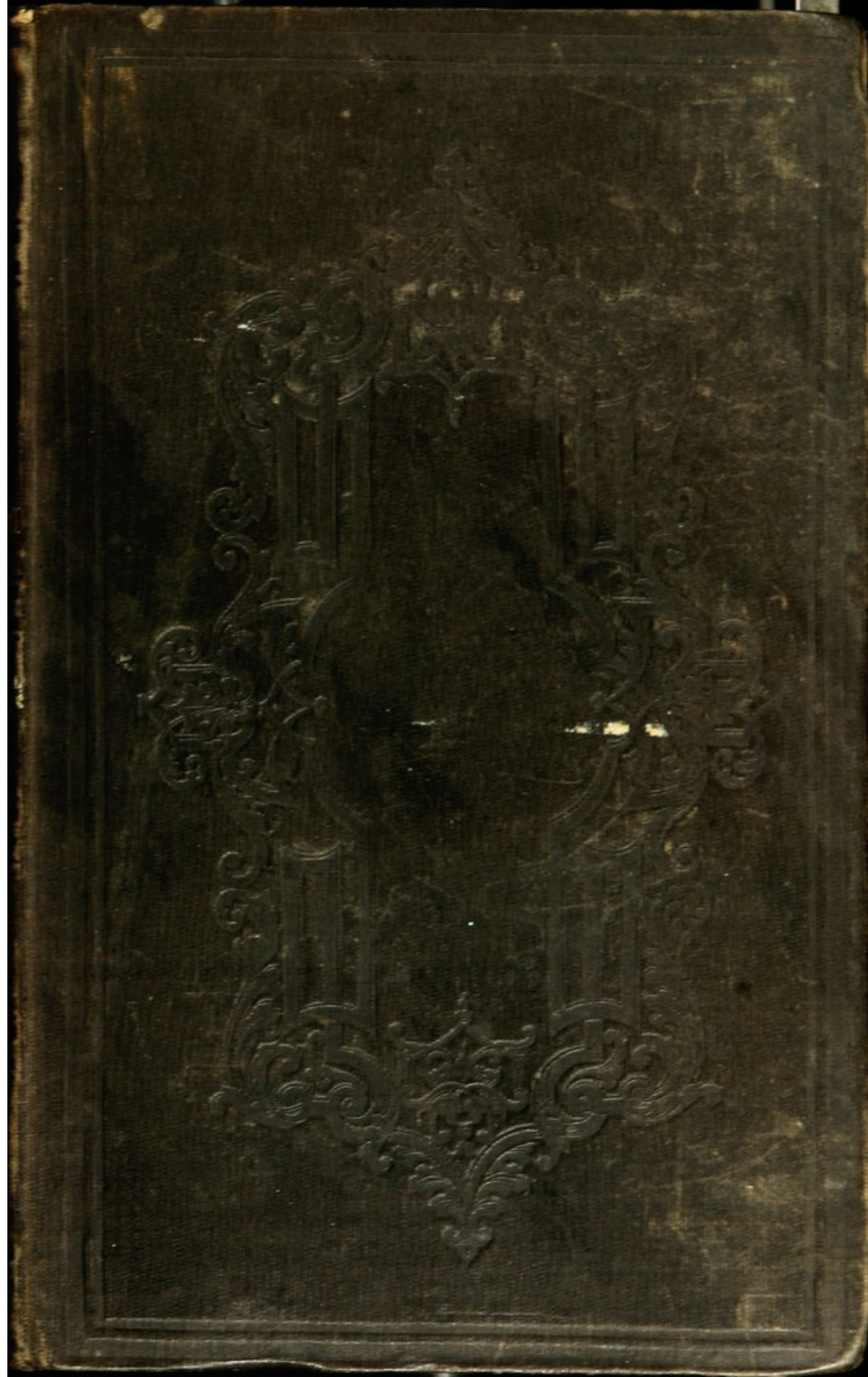
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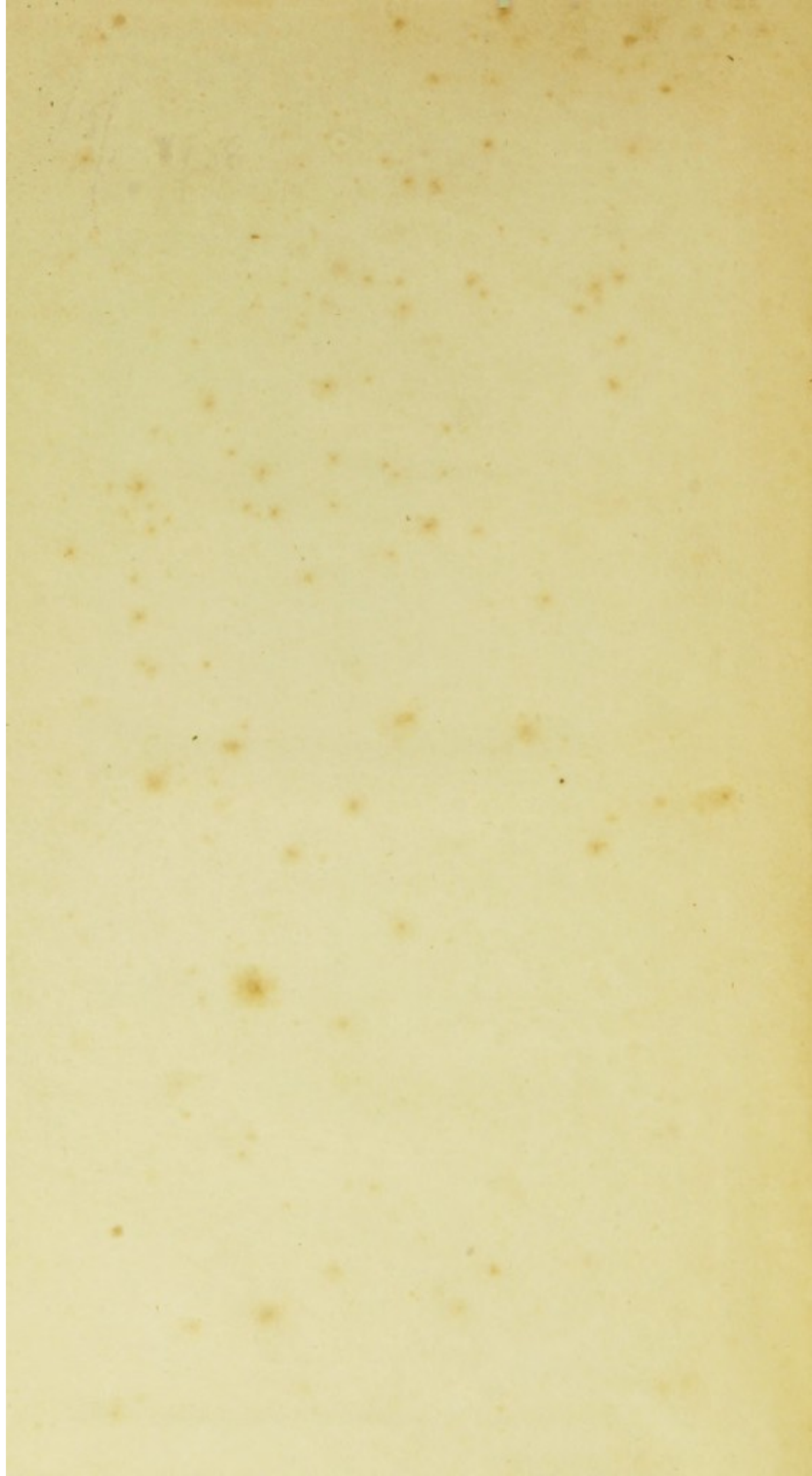
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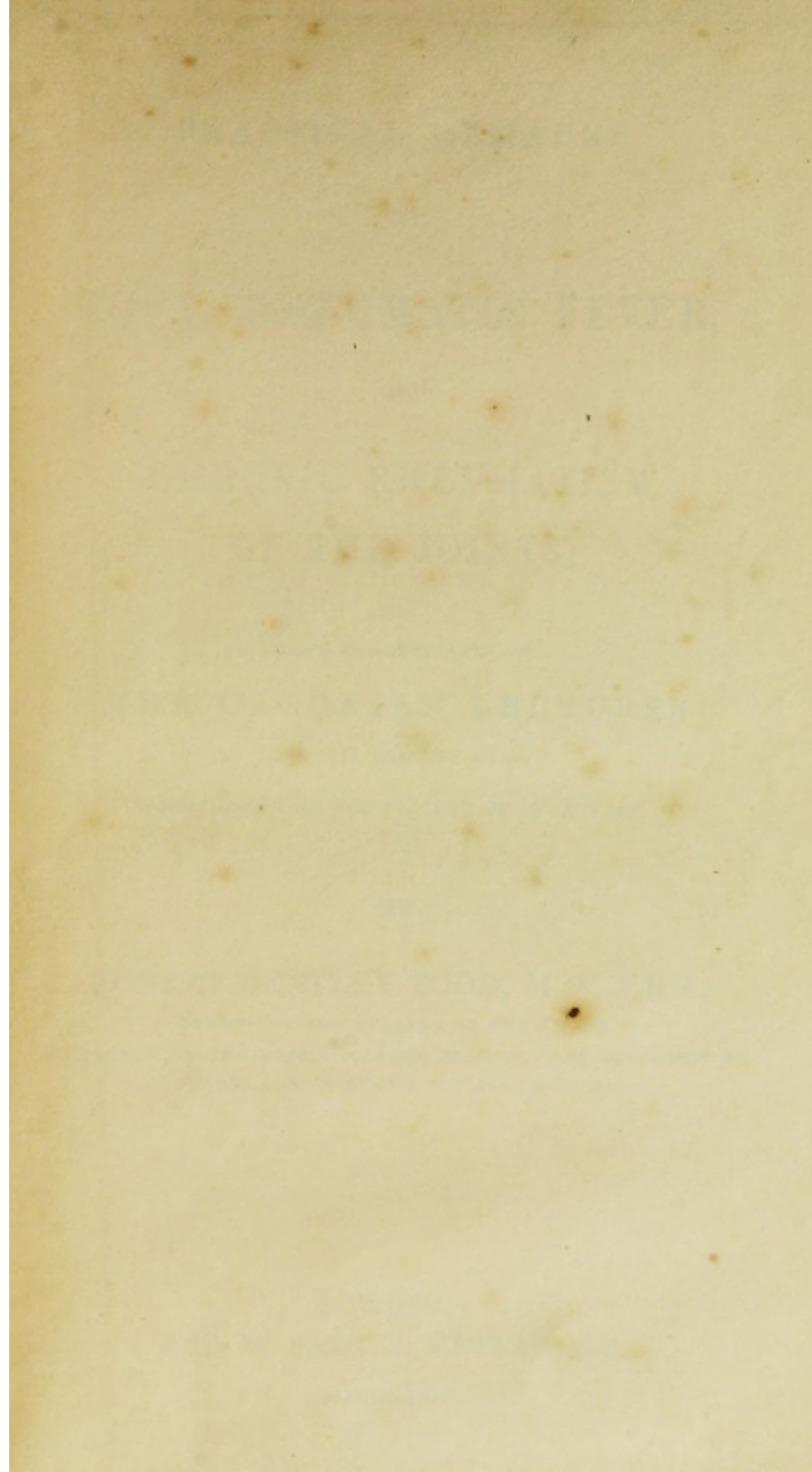
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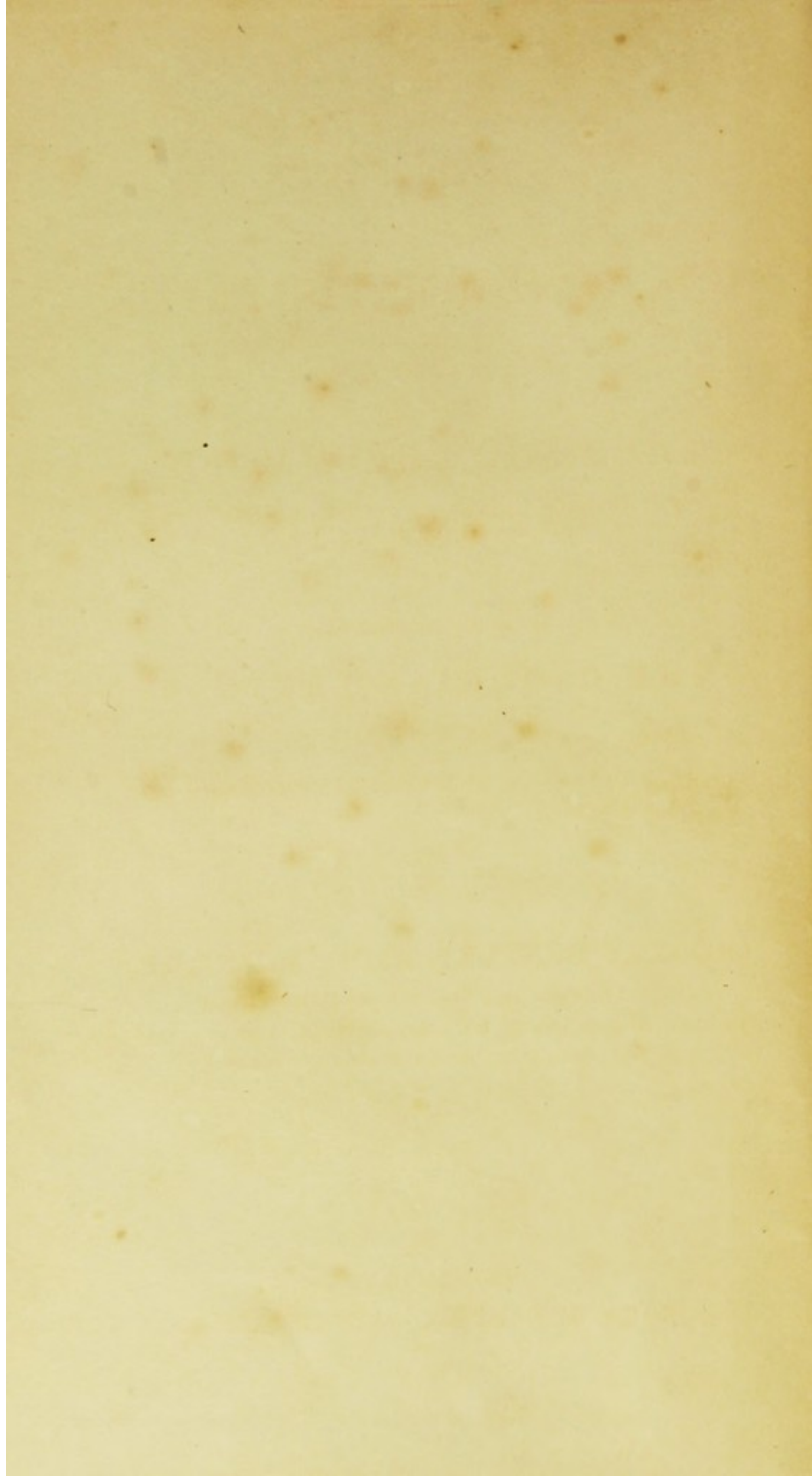
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J. Allen
Dec 8th

PRACTICAL REMARKS
ON
GOUT, RHEUMATIC FEVER,
AND
CHRONIC RHEUMATISM
OF THE JOINTS;

BEING THE SUBSTANCE OF
THE CROONIAN LECTURES
FOR THE PRESENT YEAR,
DELIVERED AT THE COLLEGE OF PHYSICIANS,

BY
ROBERT BENTLEY TODD, M.D., F.R.S.,
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PHYSICIAN TO THE KING'S COLLEGE HOSPITAL, AND PROFESSOR OF
PHYSIOLOGY IN KING'S COLLEGE, LONDON.

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ABRAHAM COLLES, M.D., M.R.I.A.,

OF DUBLIN,

THESE PAGES ARE INSCRIBED

AS A

TOKEN OF RESPECT, AFFECTION, AND GRATITUDE,

BY HIS FRIEND, AND FORMER PUPIL,

THE AUTHOR.

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PREFACE.

THE following pages contain the substance of the Croonian Lectures which the Author had the honour to deliver at the College of Physicians during the present year*.

The object, which the Author has had in view, is to place in juxta-position the leading facts in the Natural History of Gout and Rheumatism, in order to direct the attention of practitioners, in a more especial manner than has hitherto been done, to what he conceives to be their true pathology.

The work does not profess to give a complete history of these diseases; on the contrary, many details of symptoms, ætiology, and treatment, have been purposely omitted, as irrelevant to the argument, the

* The Lectures were delivered on the 24th of February, and the 1st and 3rd of March.

design of which is, by contrasting the phenomena of gout and rheumatism, with those of diseases confessedly caused by a morbid state of the fluids, to claim for them a similar origin.

The Author has availed himself of this opportunity of announcing some facts which he does not recollect to have been noticed by any previous writer on the subject. These will be found in the Section "On the Paroxysm of Gout appearing in low states of the system;" and in that "on the Rheumatic Diathesis," where it is shown that disease of the heart may come on in that state of constitution, irrespectively of the occurrence of the rheumatic paroxysm or fever.

In the eighth Section a speculation has been hazarded regarding the connexion between rheumatism and defective uterine action; which, it is hoped, may not be wholly unfounded, nor devoid of practical importance.

With respect to treatment, the Author

may be permitted to make this general observation, at present, that he feels strong objections to a lowering plan in gout; and he has considered it his duty to protest against the too prevalent practice of large bleedings in rheumatic fever.

The Author has great pleasure in acknowledging, with much gratitude, the valuable assistance he has received from several kind friends. And, in an especial manner, his warmest thanks are due to Dr. Rigby, Mr. Bowman, and Mr. W. Williams, for their most important aid while the work was passing through the press.

PARLIAMENT STREET,

April 22, 1843.

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passing through the press.

London, England
April 25, 1871.

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Part I. The 1871 Census of the United Kingdom and Ireland. The Census of 1871 was the first to be taken in the United Kingdom and Ireland. It was taken on the 3rd of April 1871. The results of the census are given in the following tables. The first table gives the total population of the United Kingdom and Ireland. The second table gives the population of each of the four countries. The third table gives the population of each of the counties. The fourth table gives the population of each of the parishes. The fifth table gives the population of each of the towns. The sixth table gives the population of each of the villages. The seventh table gives the population of each of the hamlets. The eighth table gives the population of each of the hamlets. The ninth table gives the population of each of the hamlets. The tenth table gives the population of each of the hamlets.

ON GOUT, RHEUMATIC FEVER,

ETC.

SECTION I.

IMPORTANCE OF STUDYING THE NATURAL HISTORY OF DISEASE,
ILLUSTRATED BY REFERENCE TO TYPHUS, THE EXANTHEMATA,
AND SYPHILIS—GOUT AND RHEUMATISM ARE BLOOD-DISEASES
—DEFINITION OF BLOOD-DISEASES—EXAMPLES ILLUSTRATING
THEIR GENERAL CHARACTERS—THE EXANTHEMATA—SYPHILIS
—GLANDERS—PURULENT INFECTION—LEAD CACHEXY—
BRIGHT'S DISEASE—DIABETES.

THE careful study of the natural history of disease, ought always to be an object of paramount importance to physicians. To pursue it with advantage we should observe the natural progress that the various morbid processes make, when unaffected by disturbing causes. It is obvious that the most valuable inferences are deducible from a series of such observations. They would teach us, for instance, whether a given disease tends spontaneously to a fatal result, or to recovery; and what would be its ordinary duration, when not modified by the interference of art. The real state of the various functions, in such a morbid condition of the system, would more completely develop

itself, and we should thus be enabled to judge more precisely of the degree to which they may be modified, or changed, through the influence of the disease upon them. Lastly, we should be able to ascertain, with the utmost precision, what are the leading and pathognomonic symptoms of the disease.

Such observations must necessarily throw great light on the pathology and diagnosis of disease; and, indeed, modern improvements are entirely due to observations made in this spirit. They would also be especially useful in enabling us to form a correct judgment as to the real effects of the various remedies which experience or theory lead us to employ. For it must be confessed that there is nothing upon which the physician has often greater difficulty in making up his mind than as to the effects of remedies, and there is nothing upon which a greater discordance of opinion prevails. The whole controversy between the Homœopath and the Allopath physicians, hinges upon a question as to the effects of certain drugs.

The former gravely tell us, that certain substances, which we are almost daily taking in large quantities without sensible effects, will, if administered to the sick in inconceivably minute doses, produce a manifest change in the

actions of the animal economy; whereby morbid processes may be arrested, and disordered functions may be restored to their healthy play. But in a large proportion of the maladies so treated, their natural history shows that they tend spontaneously to a cure; and in the rest, the successful issue is more fairly to be attributed to a certain modification of diet, which indeed, although not flowing from their theory of therapeutics, constitutes the chief treatment of those who profess this system, and by which the causes of disease are often removed or counteracted.

On the other hand, most of the drugs, which the Allopath physician employs, produce obvious effects, when administered in various ways, and in appreciable doses. He knows that mercury salivates, aloes purges, opium causes sleep, in the healthy as well as in the sick. It is clear that the Allopathic mode of treatment must necessarily interfere, more or less, with the ordinary course of a disease, whether for good or for evil, whilst it seems scarcely possible to admit that the Homœopathic plan, if deprived of its dietary, can do more than enable the conscientious practitioner to observe the natural history of disease, undisturbed by the interference of art.

A brief reference to one or two diseases, will serve to illustrate my position, that a careful attention to the natural history of disease is one of the chief means of advancing medical knowledge, both as regards the diagnostic and the therapeutic parts.

Let me mention first typhus fever. For how long a time this disease has been the subject of observation by physicians, and to how great an extent their views of it in successive periods were modified by the prevailing physiological doctrine of the day, are sufficiently known to those, even superficially acquainted with the history of medicine. The accumulated experience of years has now given us so great an insight into the natural course of the disease, that we may safely pronounce it to be thoroughly known in all its grades and phases. We know it to be a disease, occurring chiefly in an epidemic form, and restricted to certain limits of place, although apparently little influenced by atmospheric changes, or by local peculiarities. Its causes, therefore, are not in constant or universal operation; but occur here and there, cease for a time, and recur, according to various circumstances. We know that those, who have intercourse with the sick, are liable to take it, and do suffer in considerable num-

bers; and that, by certain precautions, the liability to infection may be considerably diminished. It is also well ascertained that it runs a certain course, and in by far the majority of cases, if the patient's strength be sufficient to enable him to withstand the depressing influence of the morbid processes, it tends to a favourable termination. In the course of the disease, certain vital organs are liable to sympathize with the general system; and the patient's danger is often greatly increased by the extent to which any of them may suffer.

In some instances the brain becomes affected, and, although organic change in this organ is rare as a consequence of typhus, yet its functions become so impaired, that delirium, or stupor, or coma may be present, complicating and obscuring the other phenomena. Or the bowels may suffer, a complication which, although less formidable in appearance, is yet more serious in reality. We have learned, moreover, that this disease, in its various epidemics, presents much diversity as regards the character and violence of its symptoms, and its fatality to the sufferers. We know that the young and middle-aged are most obnoxious to it; and it seems also well ascertained, that a person

who has once suffered from it, derives, from that first attack, a certain amount of protection against a second.

It is almost self-evident that a disease, to which such a history is applicable, cannot be the result of a mere local inflammation. The anatomical examinations of persons who have died of this malady, prove beyond all question, that no one organ is *constantly* affected: that frequently all the internal organs are devoid of every appearance of disease, and that the morbid changes which are oftenest met with, are to be regarded as its consequences, rather than as its causes.

In short the concurrent testimony of all physicians, who have carefully studied the phenomena of this disease, unbiassed by pre-conceived theories, confirms, in the strongest manner, the definition of fever long ago given by Fordyce. "Fever," says he, "is a disease which affects the whole system; it affects the head, trunk, and extremities; it affects the circulation, absorption, and the nervous system; it affects the body; it affects the mind; it is, therefore, a disease of the whole system in the fullest sense of the term. It does not, however, affect the various parts of the system uniformly and equally, but on the contrary,

sometimes one part is more affected than another*.”

The good effects of this knowledge of the natural history of typhus fever, are very manifest in the improvement that has taken place in both its prophylaxis and treatment. For the former object, our knowledge of the mode of propagation of the disease, has evidently suggested means to prevent its extension among individuals, or communities; which, wherever they have been carried into effect, have been attended with the best results. And in the treatment, we find that *now* the diligence of the physician is manifested, not in the administration of drugs, but in watching symptoms as they arise, with a view to interference where necessary; and in carefully estimating the power of the patient to bear up against the depressing influence of the morbid action. Dr. Graves, in his valuable work on Clinical Medicine, lately published, states the remarkable fact, that in the epidemics which raged in Ireland in the years 1816, 17, 18, and 19, it was found by accurate computation, that the rate of mortality was much higher among the rich than among the poor. “Since that period,” he adds, “our

* Quoted in Dr. GRAVES' *Clinical Medicine*.

practice has greatly improved, and things are much changed; the preponderance of fatal cases is now to be found among the poor; and the mortality among the rich, or those who have proper medical advice from the commencement, is not one-third of that which is found among the indigent, who are generally neglected at the commencement of the disease."

We have further evidence of the good effects of the study of the natural history of disease in our improved knowledge of the exanthemata. Who, now-a-days, would attempt to cut short an attack of small-pox or of measles? No one, surely, who was aware how fixed and determinate are the laws which influence the origin and course of these maladies. We know that they are propagated by contagion—that the poison, when introduced into the system, ere long shows its power in the premonitory fever; this is relieved by the eruption, which has its periods of maturation and decay; and the object of the practitioner must ever be, in these diseases, to pilot his patient safely through their various stages, and to guard him from the many dangerous complications which may arise in their course. As well might we think of hastening the progress of the eruptive phenomena in cases

where vaccination had been practised, as of cutting short one of the exanthemata. An extensive range of observations and experiments has proved, beyond all question, that mercury, opium, or prussic acid, are not more definite in their action on the animal œconomy, than the respective poisons of these exanthematous diseases. And here, too, modern practice, guided by a knowledge of the natural history of these diseases, is characterized by the absence of the *nimia medici diligentia*, and the substitution of a careful watching of phenomena for the officious interference with morbid processes.

In like manner the investigation of the natural history of syphilitic diseases, has led to a much more exact knowledge of those affections than was formerly possessed, and has consequently contributed much to the improved state of modern practice. The routine practice, which used to prevail, of giving mercury in every grade and variety of syphilis, greatly interfered with our obtaining an intimate acquaintance with its natural course, and practitioners were much perplexed to discriminate between the phenomena that were strictly referable to the influence of the venereal poison, and those which were to be attributed

to mercury, or to the combined influence of that mineral and syphilis. It must be confessed that the introduction of the non-mercurial mode of treatment, whatever be its real value for the permanent cure of the disease, has paved the way to a much more rational practice, and has been the means of assigning to mercury its real value as a curative agent, as well as of exonerating it from many heavy charges which its opponents had laid at its door.

On the other hand, it might easily be shown that ignorance of the natural history of disease must lead to endless mistakes in practice. This is particularly striking, when we consider how much men differ as regards their modes of practice even in the same disease, and how highly one man will estimate a remedy, to which another, of not less experience, attaches little or no value. A careful investigation of the natural history of the disease would decide between these discordant opinions, and discriminate what may be ascribed to the natural course of the malady, and what to the course of treatment pursued. The cures for epilepsy are innumerable; but the natural history of epilepsy tells us that a large number of cases depend on trivial causes, which may be easily

removed, and which sometimes disappear of their own accord, so that almost any remedy may readily acquire a reputation as a means of cure.

These reflections were excited, as I sought to explain the discordance which prevails in the opinions and practice of physicians in reference to two maladies of frequent occurrence, namely, gout and rheumatic fever. Upon neither the nature nor the proper mode of treatment of either of these maladies, but more especially of the latter, can it be said that the views of medical men coincide. We can scarcely ascribe this disagreement of opinion to absolute ignorance of the natural history of these diseases, for they have been long the subjects of close and careful observation; and the descriptions of the older physicians have not been surpassed by the *longioris ævi diligentia*. The true cause of the difference seems to consist in *an imperfect analysis* of their natural history, so that we still stand in need of a careful induction from the facts with which the observations of practical physicians have supplied us, in connexion with the improved state of our knowledge of the phenomena of nutrition in its normal state.

I propose in the present lectures to attempt

to supply this defect, and to offer some comments on the mode of practice in these diseases which have been suggested to me by my own experience.

For the sake of brevity, it will be necessary for me to anticipate the conclusion to which my argument tends, and to affirm, *that rheumatic fever and gout are diseases of the blood*, a class of maladies which modern pathology has at length enabled us to rescue from the unmerited oblivion into which they had sunk, by reason of the long reign of an exclusive solidism. I believe the phenomena of these diseases to be entirely due to the presence of a morbid element in the blood, generated within it under the influence of particular causes.

It will be advisable that I should give some description of the characters of blood-diseases.

But before proceeding to do so, let me, in order to prevent misunderstanding, separate from blood-diseases those which, originating in some local taint of nutrition, are disseminated by the blood to other and even distant parts of the body. The whole class of malignant diseases may be referred to this category; cancer, fungoid disease, &c., originate in a local derangement of nutrition, as in the stomach, the

lip, the penis, &c., where the peculiar cancer-cells are first formed. If the local malady be within reach of the surgeon's knife, and can be removed early, the best chance is afforded to the patient of being rescued from its reappearing in some other place; but if, as is too often the case, the diseased part has been allowed to remain too long, the peculiar cancerous matter makes its way into the blood, and is carried along in the current of the circulation to other organs, where they become the nuclei of new cancerous formations. Such maladies afford examples of diseases of the solids extended and disseminated through the fluids, and serve to demonstrate very strikingly how prejudicial to a sound pathology are exclusive opinions, whether they refer to the solids or to the fluids.

We must also separate those diseases which appear to arise from the deficiency of some element which forms a necessary constituent of the blood, such as purpura, scurvy, and certain states of body characterized by an anæmic condition.

In what I would call *the true blood-diseases*, a morbid matter is generated by an abnormal chemical action in the blood itself. The morbid element may be formed primarily in the blood, in consequence of some check to one or

more of the ordinary excretions, or from the supply of nutrient material to the blood being too great for the rate at which excretion is carried on; or it may have been introduced into the blood as a poison, which speedily deranges the normal changes that are continually going on within it. In this last way all contagious diseases are propagated, the matter of contagion having been introduced into the blood; malarious diseases are also referable to this cause. To either or both of the former causes, I hope to be able to show, that rheumatism and gout are attributable.

All true blood-diseases, whatever their primitive cause may be, exhibit certain characters in common. In all of them we find a greater or less degree of febrile disturbance at an early stage, and this is frequently preceded by a stage of depression and of rigor. Pains in the limbs, or in the joints, sometimes attended with swelling of the latter, and inability to move them freely in consequence of effusions into them, are very commonly met with. The cutaneous function is more or less disturbed, and this disturbance manifests itself either in a harsh, dry, and burning hot skin, or in a profuse perspiration, sometimes exhaling a disagreeable sour odour, or in a cutaneous eruption belong-

ing to one of the multifarious forms which those diseases are prone to assume. The secretions of the liver and the kidney often appear unnatural, the former being too great in quantity or altered in quality; the latter frequently rather diminished than increased, of a high colour, and depositing a brick-dust sediment in greater or less quantity. In some instances internal organs do not escape, but become the seat of an irritation which may entail very serious consequences. Those morbid matters which are introduced from without, and even some of those primarily generated in the blood, are very prone to fix themselves upon particular parts to the exclusion of others, and sometimes the life of the patient is endangered by the destructive influence of such poisonous matter upon the affected organs. As soon as the morbid matter has been eliminated from the system, these symptoms subside, and the organs affected resume their natural state.

To guard myself against the imputation of having stated merely speculative notions, I shall refer briefly to the phenomena of some diseases which are admitted on all hands to arise from the presence of a morbid matter in the blood. In the exanthemata, for instance, we find completely manifest the train of symp-

toms I have enumerated. Fever, pains in the limbs, sometimes affecting the joints, skin eruptions, local affections from the fixation of the poisonous matter in particular parts, as in scarlet fever, the sore throat; in measles, the pulmonary affection. In syphilis, the poison at first seems limited in its effects to the part through which it was introduced into the system; but by and by, as it infects the blood more completely, febrile symptoms, sore throat, cutaneous eruptions, pains and swellings of the joints, affections of the eye, show themselves, and often to a fearful extent. And nothing is more remarkable in the natural history of syphilis than the great variety of the eruptions which develope themselves upon the skin. So various are these eruptions, and so frequently do particular groups of symptoms associate themselves with particular forms of them, that Mr. Carmichael was led to advance the ingenious doctrine of a plurality of venereal poisons. The poison of gonorrhœa, too, produces analogous effects, and it is often extremely difficult to cure that severe affection of the joints which, as a secondary consequence of gonorrhœa, is known by the name of gonorrhœal rheumatism.

Several examples are now on record of a disease produced in the human subject by the

accidental inoculation of the morbid secretion from a glandered horse. "Acute glanders in the human subject," says Dr. Williams, "is ushered in by an attack of primary fever, with or without rigors. This is followed by pains in the limbs so severe as often to be mistaken for an attack of acute rheumatism." Abscesses occur in various parts of the body. An eruption of pustules occurs on the face, trunk, limbs, and genital organs. This eruption is preceded and accompanied with profuse foetid sweats.

Let me, by way of illustration, quote a well-stated case from Dr. Williams' able work on morbid poisons.

William Johnson, ætat. 23, was admitted on the 31st of January, 1833, into St. Thomas's Hospital, under the care of Dr. Williams. This patient complained of tightness across the chest, and of pains in the right side and loins, in consequence, as he imagined, of a fall from a horse about three months before. He had also much thirst, a tongue coated with yellow mucus, and a pulse about 90. These symptoms had nothing characteristic, but as the disease advanced, they assumed a peculiarity which caused them to be watched with much anxiety, for without any considerable fever, he

became incoherent in his answers, and his tongue was tremulous. On the 10th Feb. he was seized with an attack of delirium so furious, that it was necessary to strap him to the bed. He was still, however, capable of giving some account of himself, and complained of gnawing pains in all his limbs, of great difficulty in moving his left arm, every joint of which was painful, and the knuckle of the fore-finger and hand was red, swollen, and painful. There was also a profuse, sour, and offensive perspiration. The disease was now considered to be an attack of acute rheumatism. On the 14th, however, an offensive yellow discharge took place from the right nostril, and a large swelling arose in the middle of the forehead of a purplish hue, and the left eye was nearly closed, and numerous tumefactions took place on the arms and legs, while several phlyzacious pustules were seen on the left side of the neck. The man was now questioned as to his occupation, when he stated that he had been grooming a glandered horse, kept in a stable by itself, and that he remembered the discharge from the nostril had frequently fallen upon his hand, where the scar of a wound was still visible. * * * * On the following day, the 15th, the whole scalp had become tumefied, the forehead purplish,

the eyelids red and shining, the sensation in his throat and nostrils was burning, his thirst intense, and more tumefactions appeared on the extremities and abdomen, while several phlyzacious postules were seen on the left side of the neck. * * * * On the 17th he died.

When the blood is infected with pus, in consequence of its formation in a vein after phlebitis, or by any other means, a train of phenomena very similar to those I have detailed occurs in consequence of this poisonous material being carried to every part of the body in the circulating fluid. It is well known that these serious effects often follow great surgical operations, injuries of the head, or compound fractures, also idiopathic inflammation of a vein, as in some cases on record of inflammation of a sinus of the dura mater; and I have seen them consequent on the bursting of an abscess, which formed in the septum of the heart. There seems now to be little doubt that at least some forms of puerperal fever may be due to a vitiated state of the blood produced through the uterine veins. In all these instances, pus or other morbid agents formed in, or introduced into the veins, may be carried to every organ.

The symptoms of this purulent infection

are, fever of a low typhoid character, (often preceded or accompanied by rigors,) and secondary affections of parts remote from the seat of the primary affection; these are apparently of an inflammatory character and quickly terminate in effusions of pus. No parts are more frequently affected than the joints, the synovial membranes and the cartilages of which become destroyed, and their cavities filled with pus. The subcutaneous and intermuscular cellular tissues, also, suffer extensively; abscesses form in the solid viscera, the lungs or liver. The eye, too, becomes affected in some instances.

Symptoms of a very similar kind follow the introduction of dead animal matter into the blood from a wound received in dissection. These phenomena are so similar to those which have been produced in animals by the injection of pus or other decaying fluids into the blood, that no doubt exists as to their being produced by the presence of an analogous poison in the circulation.

It is particularly worthy of observation, that in all the diseases that I have enumerated, the joints suffered to a greater or less degree, as also the skin, or the subcutaneous cellular tissue: and that some one or more of the internal viscera were affected.

In house-painters and others, whose occupations expose them to the fumes of *lead*, the system becomes contaminated with this poison, which shows itself by the remarkable sign first indicated by Dr. Burton, namely, the blue line at the margin of the gums surrounding the necks of the teeth. And, indeed, in some individuals, exposure to the fumes of lead, for a short time, will contaminate the system. I have known a person to present all the phenomena of the lead cachexy from sleeping for some time in a room in which a pot of paint was kept.

In these patients the symptoms, although of a chronic kind, are precisely those which would arise from a poison circulating in the blood. Passing over the more peculiar symptoms of colic and palsy, I may notice the frequent complaint that such patients make of rheumatic pains—affecting the muscles and joints; and I may also observe that the poison is often attracted strongly to internal organs, which it may affect functionally, or disorganize to a most destructive extent. A man of fifty years of age, a house-painter of intemperate habits, had frequently suffered from lead colic, and was slightly affected with wrist-drop, from which however he had completely recovered.

For two or three of his attacks of colic he was treated in the King's College Hospital. In December last this man was brought into the hospital, and placed under my care; he had had a severe epileptic fit, which ended in continued coma. In this state he was brought to the hospital, and soon had a second fit also of epileptic character. After a few days he recovered considerably, but still showed evidence of much cerebral disturbance, by a wildness of manner, and incoherence of expression, which struck every one who saw him as resembling those which occur in delirium tremens. Opium and stimulants were highly beneficial to him, and we began to entertain hopes of his ultimate recovery. However, after the lapse of several days he again became stupid; and now we noticed a remarkable fœtor of the breath, which at once excited suspicions as to the existence of gangrene of the lung. He sunk quickly after this symptom showed itself.

I had from the commencement felt certain that the cerebral symptoms were, at least principally, the result of poisoning by lead. The *post mortem* examination confirmed this opinion, and afforded other highly interesting information.

The brain was pale, much shrunken, and

the grey matter of a very light colour. A good deal of subarachnoid fluid existed in consequence of the shrunken state of the cerebral convolutions. There was no disorganization of the brain.

The right lung, besides a large gangrenous cavity in its centre, exhibited a very extensive lobular inflammation, affecting the apex as well as the base of the organ. Many lobules were hepatized; others in incipient suppuration, and some were the seat of little abscesses. In all the inflammation appeared to have begun around a point, as a centre, and to have extended throughout the lobule; and in many of those in which the inflammation was in an early stage, I found in the centre of each a very minute blackish point, suggesting the notion that it might be some compound of lead, entangled in the pulmonary tissue, and exciting inflammation around it. The appearances in this lung forcibly called to mind the description given by Cruveilhier of the effects consequent upon the injection of quicksilver into the veins. In those cases, the globules of mercury were the centres around which as many lobular inflammations took place.

It was ascertained, on chemical analysis, that lead existed in great quantity in the

brain; and in the lung this metal was found in still greater proportion. There could be no doubt that the presence of the metal was the cause of the functional disturbance of the former organ, and of the disorganizing process in the other.

I shall adduce two more examples of diseases, many of the symptoms of which are attributable to a morbid matter circulating in the blood.

The first of these is diabetes. The saccharine principle, formed primarily in the stomach, and not reduced by that organ, finds its way into the blood, and gives rise to the first infection of that fluid, whence it soon appears in the secretions, but more especially in that which contains the largest proportion of water. Soon, however, the sugar is formed in the secondary processes of assimilation, and is conveyed to the blood by the lymphatic system, so that in the confirmed stages of the disease, the morbid matter is generated at every part of the body. Here, besides the fever of a hectic kind, we find great derangement of the renal functions by the stimulating influence of the sugar, displaying itself in the copious diuresis which is so frequent an attendant on this malady; the skin also suffers from, and shows

marks of the presence of this poison; it is harsh, dry, and cold. Scaly and other diseases frequently *precede*, as Dr. Prout states, the full establishment of the diabetic symptoms; and the subcutaneous cellular tissue, the nidus of the blood-vessels of the skin, becomes the seat of boils and carbuncles, or even abscesses, the consequence of an irritating agent in the blood. These *accompany* the full developement of the disease; and Dr. Prout relates the case of a middle-aged man, who told him that for a long period he had been subject, at intervals of a year or two, to boils, one of which, generally on the back or neck, assumed the form of carbuncle; and that during such attacks he always passed a large quantity of saccharine urine. Dr. Prout saw this patient when he was recovering from one of these carbuncular attacks, and at that time his urine was highly saccharine. It is to be regretted in this case that the pus from the carbuncles was not subjected to analysis.

In diabetes, as in other diseases of this class, the irritating influence of the poison may be strongly determined to particular parts, and then other parts and those perhaps, which are ordinarily affected, will be relieved from irri-

tation. This is strikingly manifested in a patient now under my care in the King's College Hospital, labouring under this disease. The mucous membrane of the stomach and bowels appears to be the seat of an intense irritation, giving rise to great tenderness on pressure over these organs, and to a violent and uncontrollable diarrhœa. The matters ejected from the stomach have been found to contain sugar; and this substance has also been proved to exist in the blood; yet, in this case, so strongly is the irritating agent attracted to the gastrointestinal membrane, that for many weeks the quantity of urine passed has not exceeded the natural quantity, and has even fallen below it.

In that very frequent and formidable affection, now so well known to practical physicians, the granular disease of the kidney, or Bright's disease, the functions of the skin are among the first that are deranged. The office of this organ, as a great emunctory to the body, is completely in abeyance, and in the early stages the disease may be checked or greatly alleviated by the restoration of its secreting action; but when the disease is completely established, a vast number of secondary affections show themselves in situations remote from the kidney; indicating

that the morbid agent must be extensively disseminated throughout the body. Among these, what has been called chronic rheumatism has been specially noticed. Dr. Christison considers it among the more frequent of the secondary affections. He says: "On investigating the early history of many cases, which have first come under my notice in the advanced stage, my attention has been drawn to the frequency with which reference was made to rheumatic pains, as one of the previous symptoms; repeated instances of the same complication have occurred after the admission of patients into the infirmary; and, in short, this connection has appeared to me so far common, that I never meet with cases of obstinate chronic rheumatism without being led to make inquiry into the state of the urinary secretion. The form in which it commonly appears is that of mere neuralgia, without swelling or redness of the affected parts, and seated in the muscles more frequently than in the joints; but sometimes swelling of the joints may be remarked." The serous membranes are frequently acutely affected in this disease. Pleuritis or peritonitis, or both, will supervene in the course of it, and often greatly endanger, if not destroy the patient.

Disease of the heart is also a frequent complication, and seems, at least in a majority of cases, to be a consequence of this malady. Diseased liver also accompanies it; but as the same causes which give rise to the granular kidney may cause the hepatic disease, we cannot perhaps fairly attribute the latter affection to the former. Nor does the brain escape; for its functions are frequently seriously impaired, and a state of coma is a common forerunner of the death of such patients.

Now in this disease there is such an organic change in the kidney, as materially interferes with the due elimination of urea from the blood; this substance, therefore, accumulates in the circulation, in greater or less proportion, and acts as a poison, infecting various parts of the system in succession.

Enough, doubtless, has now been said to show that those diseases which are admitted to result from a foreign matter, or from a poison, circulating in the blood, manifest certain phenomena of a very similar or analogous kind, however dissimilar the morbid agents may be from each other.

It has been shown, that in all, the cutaneous system is apt to suffer, or the subcutaneous tissue; that the joints are liable to be affected

acutely or chronically; that certain internal organs may sympathise with other parts; and that more or less of general febrile movement is induced.

SECTION II.

GENERAL REVIEW OF THE NATURAL HISTORY OF GOUT—THE GOUTY DIATHESIS—THE PAROXYSM OF GOUT—EFFECTS OF GOUT UPON THE JOINTS—GOUTY CONCRETIONS—GOUT AFFECTING THE STOMACH; THE BRAIN; THE URETHRA, AND BLADDER—GOUTY BRONCHITIS—GOUTY COUGH—GOUT AFFECTING THE SPINAL CORD; THE EYE.

I NOW proceed to inquire how far the two diseases, gout and rheumatic fever, admit of being classed with those which have been enumerated in the last Section; in other words, how far their symptoms are referable to the presence of a morbid matter infecting the vital fluid.

It is not my intention to give a formal description of these diseases; I merely propose to refer to such of their features as more immediately bear upon that view of their pathology which I am anxious to establish.

In taking a review of the natural history of gout, we may notice that it puts on the following forms:—

First, it so modifies the functions in general, as to give rise to that state of constitution which has been called *the gouty diathesis*.

This is often little more than an aggravated lithic acid diathesis. The lithate of ammonia, or even lithic acid in the free state, is a frequent

sediment in the urine; the patient is liable to more or less of dyspepsia, with uneasy feelings in the stomach and duodenum; and the secretions of the bowels are of an irregular kind. But more frequently other symptoms accompany these; pains apparently of a vague kind, varying much in intensity, and often of that sudden character more expressively termed *twinges*, are felt about the limbs in the neighbourhood of the joints. The feet and ancles are more frequently affected than other parts; and in some instances I have known the feet so irritable as to occasion much difficulty and pain in walking.

These symptoms vary in severity in the same individual at different times, and appear to come on, almost periodically, in paroxysms, for, coincident with the irritable state of the feet, there appear a feverish state of the system, an increase of the dyspeptic symptoms, and an abundant lithic sediment in the urine. The slightest irregularity of diet is speedily felt, and quickly aggravates the symptoms; the stomach is extremely intolerant of acids; it is flatulent, and the patient is much troubled with sour eructations. The temper is flurried, and the spirits depressed. The skin is irritable; the patient complains of itching of

the skin on the back and shoulders, as well as of that of the feet and legs; and sometimes he is troubled with cutaneous affections of a chronic and obstinate kind.

Men of the gouty habit are often very hypochondriacal, and will sometimes betray a degree of weakness of feeling and temper nearly approaching a state of hysteria. And women, who in general are much less subject to gout than men, exhibit, when of the gouty temperament, great proneness to hysterical paroxysms.

The gouty diathesis disposes to peculiar affections of internal organs, so different, as regards their tractableness to ordinary remedies, from the common diseases of those parts, that their connexion with some particular state of the general habit is clearly indicated. Two patients of mine, in no way connected with or known to each other, manifest all the signs of this temperament, and I find always consequent upon a kind of exacerbation to which they are almost periodically liable, a considerable discharge from the bowels of mucus coloured with bile; this will continue for three or four days, and never fails to bring great relief. Head-aches, often simulating those of organic disease, are frequent attendants on this form of consti-

tution, as also palpitations of the heart, and irritant affections of the bronchial and tracheal mucous membranes.

In some persons no further signs of gout, than those which characterize the diathesis, occur throughout a long life. But in many the first appearance of the marks of the gouty constitution is quickly followed by a paroxysm, by the sudden seizure of some part of the body, generally a joint, by what has been called gouty inflammation; and "the fit of the gout" thus manifested, may frequently recur at variable intervals. There is often, however, much tendency to periodicity in the returns of the paroxysms, and their disposition to occur at the spring and fall of the year has been long and popularly remarked.

In the early attacks a single joint only is affected; but subsequently several will be visited by the disease. Gout shows, at first, a decided predilection for the small joints, those of the hand and foot, but in time, all the articulations are obnoxious to it; and not only they, but also tendons, ligaments, bursæ, and synovial sheaths. Sometimes it will attack several joints simultaneously, the hand, the foot, the knee, the elbow; and again, it will affect them in succession, shifting with rapidity

from one to the other. Gout affecting the large joints simultaneously, is frequently confounded with rheumatic fever.

These attacks are always attended with, and preceded by more or less of constitutional fever; and it generally happens that the amount of this fever is proportionate to that of the local disorder, although the latter must rather be regarded as in some measure an index to and outlet for the former.

The natural tendency of these paroxysms is to a spontaneous resolution. The local disorder, in first attacks, leaves the joints uninjured; or with a degree of injury so slight as to be scarcely appreciable, and the constitutional fever disappears with it. This course the disease is prone to take in otherwise healthy constitutions; but there are exceptions to it.

A second, a third, or subsequent attack is not so innocent to the articular textures. The most common effect of the gouty paroxysm, is an effusion of fluid into the synovial membrane or synovial sheath. This may be absorbed slowly or quickly. In some instances there remains an apparent or real thickening of the membrane; this, if real, may arise from actual deposit on the membrane; but more frequently it is from effusion into the subcutaneous tissue.

Sometimes the ligaments are affected; sometimes also the tendons. These parts undergo a change of structure, evidently from the deposition of some new matter between the fibres of the ligament or tendon, by which the natural flexibility is more or less impaired; and in addition to this rigidity they become shortened, and impede the motions of the finger or toe.

In the fit of gout the skin of the affected part suffers: it is red, and has all the appearance of being the seat of an inflammatory process. As this subsides, the cuticle is apt to desquamate, when the inflammation has been at all violent. The subcutaneous veins are generally large around joints suffering from gout, and often continue so for some time after the attack has gone off.

The inflammation of gout, affecting a joint, is not usually of a destructive kind; certainly not so, unless the joint has been frequently attacked. Suppuration rarely, if ever, occurs; but in a very acute attack the cartilages may be destroyed, and ankylosis of the joint result. I have known ankylosis of the first joint of the great toe to result from a single severe attack of gout.

In some cases a peculiar deposit takes place upon the surface of the articular cartilages

producing an appearance as if they had been smeared over by a thin layer of plaster of Paris. This deposit is a compound of lithate of soda mixed with some phosphate and carbonate of lime. A deposit of this kind also takes place around the joints external to the synovial membrane, forming swellings beneath the skin. Sometimes these swellings occur along the course of the tendons of the fingers or toes, and the lithate of soda becomes mingled with the fibres of the tendons. I have also several times observed deposits of this kind beneath the skin covering the external ear; and they have been found in connexion with the nasal cartilages. These are the well-known, so called, *chalk-stones* of gout, or *gouty concretions*, the deposition of which disfigures the joints, displacing the bones, and rendering the whole hand or foot crooked and misshapen. It is remarkable that those deposits occur much more frequently in the hands than in the feet.

These tumours increase to an enormous size by the deposition of lithate of soda. At every fresh attack, there is a new quantity deposited; and by the increase of size, the skin becomes stretched over the earthy mass, and often ulcerates. In some rare instances the excretion of this matter takes place con-

tinually: in these cases the chalk-stones have formed ulcers, and the secretion of the chalky material goes on from the bottom of those ulcers. A case is recorded of an officer, who, for some years before his death, which took place at the age of forty-five, was much affected with gout: many balls of chalk were removed from his hands, and he could write on the table with the point of his finger. Ulcers had also formed on his feet, which usually discharged an ounce of fluid chalk every twenty-four hours.

The situations at which the elimination of this remarkable substance takes place, are these: the articular surfaces of the bones; the exterior of the synovial membranes, as well articular, as bursal; tendons and ligaments; the subcutaneous tissue immediately around joints; the subcutaneous tissue over the cartilage of the ear, and those of the nose. The skin itself may, I believe, be similarly affected.

May not the deposits which take place in arteries, and on the valves of the heart, be frequently of the gouty kind? One or two writers state that they have found lithate of soda in them; but in general they are composed of phosphate and carbonate of lime.

Certain internal parts are liable to be

affected by gout. Of these the stomach appears to be the most frequently attacked. There can be little doubt that in the majority of instances this organ is thrown into a state of spasm; and, that inflammation of it rarely occurs. The heart may also be attacked, probably in a similar manner, occasioning a functional and not an organic disturbance of its muscular fibres. Gout may affect the brain also; but in what precise way this organ suffers, does not very clearly appear. A connexion between apoplexy and gout has long been known: but the term apoplexy is frequently applied vaguely to any sudden affection of the brain, as well as to that which results from rupture of a blood-vessel. The urethra and bladder seem peculiarly obnoxious to gout; but the affection of these parts generally precedes the developement of the gout in the joints, and is relieved when it appears externally. The bronchitis, which occurs in gouty subjects, seems to be of the same kind. A well marked example of this came before me last year. A man was brought into the hospital labouring under pleurisy of slight extent, with severe bronchitis affecting the minutest ramifications of the tubes. The former disease yielded readily to treatment; but the latter proved extremely

obstinate, and did not give way, until gout made its appearance in the foot, when it quickly disappeared, and the patient was discharged quite well.

There is a kind of cough which occurs in persons of gouty habit, as well as in those who have had fits of gout, which I think is not referable to bronchial irritation; but is due to an accumulation around the larynx of mucus, probably of the same kind as that which causes fur on the tongue: the cough is a true stomach cough, for it is always diminished or increased as that organ is less or more affected.

Dr. Graves describes some examples of disease of the spinal cord, connected with and apparently caused by gout. One of these cases occurred in the person of a gentleman, aged about thirty-three. He was subject to attacks of severe colic, preceded or followed by a gouty affection of the feet. After several of these attacks, he became affected with great weakness of his wrists, with pains in his fingers, particularly in the last joints. As the disease progressed these pains became more intense and extensive, and the torture he felt in his hands and arms was beyond description. Paralysis of the upper extremities shortly came on, and this was soon followed by paralysis of

the lower. Shortly after the paralytic affection had thus decidedly shown itself, he had an attack of gout in his feet; which was followed by several others in succession. After each attack of pain in the feet, the paralytic state of all his limbs increased, and if he gained a little strength in the intervals between these attacks, a recurrence of the paroxysms always made him worse than before.

On examination after death, the spinal cord was found to be softened to the consistence of thick cream, opposite the last cervical and first dorsal vertebra.

The eye is among the parts which become secondarily affected in gout. This organ, like the others which have been enumerated, is affected only after several attacks of the disease in other parts where the diathesis is thoroughly established. It does not appear that the effects of this disease show themselves only in one of the various textures of the eye; it attacks most of them in succession, and ultimately destroys vision. The conjunctiva and the sclerotic are the first affected, and afterwards the choroid and iris; the latter of which forms adhesions to the neighbouring parts, and these intercept the rays of light. Perhaps also the retina suffers; indeed we can scarcely con-

ceive any serious or long-continued affection of the sclerotic and choroid coats of the eye, without the other textures undergoing considerable change.

It would seem that the eye may be primarily attacked by gout. Of this Mr. Wardrop relates a remarkable example. A gentleman had long suffered from arthritic inflammation of the eye accompanied by severe pain in the head. Mr. Wardrop advised him to apply sinapisms to each foot, and, being a man of great fortitude, he allowed them to remain on until so violent an inflammation ensued, that it terminated in ulceration of the skin; but the pain in his eyes and head was completely relieved. Some years afterwards, on Mr. Wardrop's inquiring if he had ever had any return of the inflammation in his eye, he answered with a smile, that the sinapisms had completely removed it.

SECTION III.

OF THE GOUTY PAROXYSM, DEVELOPING ITSELF IN DEPRESSED
STATES OF THE SYSTEM.

It does not appear to have attracted any notice, that a low or depressed state of the system is favourable to the developement of the gouty paroxysm.

The determination of this fact in the natural history of gout is so interesting in a practical point of view, and at the same time so important to a correct view of its pathology, that I deem it incumbent on me to direct special attention to it, and the more so, as it seems to have altogether escaped the notice of the best writers on the disease.

An asthenic form of gout has long been recognized by practitioners; in such cases, however, the asthenic state of constitution had been brought on by previous repeated attacks of the disease.

But I hope to be able to show by reference to cases, that, under certain circumstances, a feeble, or even exhausted condition of body, the very opposite indeed to that so often seen in acute gout, will favour the developement and

the recurrence of the paroxysm of this malady. And I cannot avoid adding my strong suspicion, that the popular prejudice against colchicum as tending to shorten the intervals between the paroxysms of gout, may be not altogether unfounded, and that the bad reputation of the medicine, in this respect, may be owing to the injudicious use of it in too large doses, which by their lowering and depressing effect may have favoured the more frequent recurrence of the fits.

The first occasion on which my attention was drawn to this circumstance, was in attending a gentleman of robust constitution, about thirty years of age, accustomed to field sports and active exercise. This gentleman inherited gout; but as he lived much in society, and paid no particular attention to dietetic rules, he was not exempt from the charge of having contributed to it himself. I attended him for an attack of gout in the great toe, presenting all the ordinary characters; this yielded very readily to treatment, and he took colchicum for a time. After his recovery I directed him to pursue a plan of diet, taking animal food in moderation, abstaining from malt liquor, and using wine in very small quantities. In the space of three or four months afterwards, I was

surprised to find that this gentleman had as many attacks of gout in the same toe ; although he assured me he had not committed any error of diet to give occasion to the so frequent recurrence of the fits.

I now perceived that he had become very thin, and altered in appearance ; from being robust, muscular, and fresh-coloured, he had become pale, and his muscles soft and flabby. A member of his family informed me that he had been carrying my plan of regimen too far ; he had become a teetotaller, and frequently avoided taking meat. It at once occurred to me, that the enfeebled state of his system might favour that derangement of the assimilating process in which gout doubtless primarily consists ; and, although I avoided a stimulating plan, I recommended a good diet and tonic remedies : soon afterwards he went abroad, and has not been troubled with gout since (a period of two years).

Some time after this case, I was much interested by one which occurred in King's College Hospital. James Mills, ætat. 29, a painter, subject to several attacks of lead colic, was admitted into the Hospital, labouring under that disease, on 17th February, 1842. His sufferings from colic were of the most

severe nature. He had to a striking degree the peculiar anæmic look so common in patients of that kind. It did not appear that he had ever had gout. He was put on milk diet, and treated by large warm water injections; and in four days was greatly relieved from the attack of colic. At my visit on the 21st, he directed my attention to a painful swelling of the right great toe, which had come on suddenly in the night. The next day this swelling had increased considerably; there was abundant effusion into the sheath of the extensor tendon, the swelling was red and exquisitely painful, and he could not bear the weight of the bed-clothes. This patient got one night-draught with opium and colchicum; but in two days afterwards his diet was increased, and he was ordered a bitter tonic, and he left the hospital quite well on the 1st of March.

This same individual was admitted again into the hospital in October last, suffering under a very severe fit of lead colic. He was treated again by injections of warm water, according to Dr. Wilson's excellent plan, and in three days he experienced great relief from the colic. On the 1st of November, being in a state of great exhaustion by reason of his acute sufferings from colic, he was attacked

with gouty swelling in the great toe of the right foot, which was extremely painful. On this occasion I did not give him any medicine, but ordered him a pint of porter and meat diet. The pain and swelling subsided in the course of two or three days.

Within the last few weeks a very remarkable case of the same kind has come before me.

A man, *ætat.* 50, was admitted into the hospital on the 18th of January, 1843. He was universally anasarcaous, and his abdomen contained a good deal of water. He stated that the swellings commenced three weeks ago; and at the same time his urine decreased considerably in quantity, and he was frequently disturbed in the night to pass it. The swelling began in his face. At his admission he had all the appearance of a person labouring under Bright's disease of the kidney; and such on further examination proved to be the case. The skin was dry and harsh, the urine highly albuminous, and of specific gravity 1010.

On inquiring into the previous habits of this patient, we found that during the last three years he had been very subject to what he called rheumatic gout; that he was accustomed to live well, and drank beer and spirits

habitually, and was in comfortable circumstances, being employed as a porter in the East India Company's warehouses.

I directed this patient to be treated by the hot-air bath; which was done for two nights, bringing out a copious perspiration each night.

Immediately after the second bath he was seized with vomiting, which continued constantly through the night. The vomiting was allayed on the next day by brandy and opium. There was no tenderness over the stomach.

In the course of the day he had a recurrence of the vomiting, but with less severity.

At 10 o'clock the same night he was seized with an epileptic fit; he had been asleep, and the attention of those near him was attracted by his breathing loudly and with stertor. The fit lasted ten minutes, and then the stertor ceased, and he opened his eyes. In ten minutes more he relapsed into another fit, in which he was a good deal convulsed. From this he recovered quickly.

On the 23rd and 24th, although sensible, he was in a torpid state, complained of headache, and passed urine in very small quantity; his pulse was 72, and very sluggish.

Regarding these symptoms as resulting from the accumulation of urea in the blood, I pre-

scribed elaterium and a large blister to the nape of the neck. Urea was obtained from the serum of the blister.

He continued the use of the elaterium from the 26th of January to the 7th of February, and was freely purged by it; the torpid state passed off, and the renal secretion was restored to its natural quantity; but he was in a state of great weakness. On the 7th, he began to complain of a violent itching in the right hand and foot. On the 8th, there appeared a red blush on the metacarpal joints of the right hand, and considerable gouty swelling of the hand and fingers, and on the fourth toe of each foot, slightly extending to the dorsum of the left. The urine, which had ceased to be albuminous, now becoming dark and smoky in colour, and threw down a precipitate of dark lithates. The bowels had been much purged in the morning. He was ordered meat diet, and morphia at bed-time.

On the 9th, the hand and feet were a little better; but he was seized in the night with violent pain in the stomach, with exquisite tenderness on pressure, and rejected everything he swallowed; the pain subsided a little in the morning, but recurred in the afternoon; and he appeared to be labouring under what seemed to

me to be evidently a severe attack of gout affecting the hand and feet, and also the stomach. Mustard cataplasms were applied to the epigastrium. I immediately gave him some hot brandy and water, and ordered him to take six grains of the sesquicarbonate of ammonia with five minims of tincture of opium, every four hours.

The stomach pain was relieved in the course of the afternoon; next day the vomiting had ceased, but there was still slight epigastric pain. He continued to take the ammonia and meat diet, and in the course of a few days his gout became much relieved.

I am indebted to my friend and former pupil, Dr. George Johnson, for the notes of the following case, which occurred in the King's College Hospital while he was house surgeon to it.

George Waters, ætat. 35, drayman, of large and robust make, in the habit of drinking daily large quantities of porter, was admitted into the surgical ward December 24th, on account of an injury of the left hand. During the first three or four days he was kept on low diet and took purgative medicine; he was then ordered middle diet and one pint of porter per diem. After being in the hospital about a week, he had a very severe attack of gout in both feet;

the same diet was continued, and he took ten minims of colchicum wine three times a day. The gout subsided in five or six days, but he complained of pains in his feet until the time when he left the hospital, which was nearly a month after his admission. He had never had gout before this attack.

The following very remarkable case has been communicated to me by my friend Dr. James Russell, the late Physician's Assistant in King's College Hospital.

Miss —, aged about fifty-four, of spare habit, has suffered during a great part of her life from very severe headaches: they occurred at tolerably regular intervals of a fortnight or three weeks: were accompanied with vomiting, and appeared to depend on a disordered condition of the stomach. She has always lived abstemiously. None of her family have suffered from gout.

During the last four years she has had less of active occupation than formerly: probably from this cause she has suffered from depression of spirits. Her general health continued good until the early part of last year, when she suffered from dyspeptic pains. She then altered her mode of life; and partly from disinclination to eat, partly from the idea that she might

relieve her headaches by starving, she reduced her allowance of food: took only a small allowance of meat, and seldom any vegetables: and she entirely abstained from malt liquor and from wine.

Under this regimen she became weak and pallid, and her health suffered materially; her spirits became more depressed, but she did not suffer from any distinct bodily disorder until last August. About three months after she had adopted the new system of diet, she had a feverish attack, which confined her to bed for two or three days, and weakened her very much; as she was somewhat regaining strength, she was attacked suddenly with gout. The disease was confined to the great toe of the left foot, and was attended with all the characteristic pain, tenderness, and swelling. She recovered from this attack very slowly; it was upwards of a fortnight before she was able to walk, and she still has slight occasional pain in the foot.

She has since had some threatenings of gout in the right foot; but has not had a distinct attack. Her former ailments have undergone very little alteration; but under a more generous system of diet, her general health has materially improved.

Whilst I was engaged in delivering these Lectures at the College of Physicians, another very remarkable case occurred in the Hospital, strongly confirmatory of the views I have expressed. For the notes of the case I have again to thank my friend Dr. George Johnson.

William Keeble, ætat. 60, a footman, admitted into King's College Hospital on Tuesday, February 21, on account of a strangulated inguinal hernia. He inherits gout from his father, and has had several attacks during the last ten years. He had a very slight attack about four days before his admission. Before the hernia could be reduced he had purgative enemata, was placed in a warm bath, in which he remained more than two hours; he took one grain and a half of tartar emetic, and was bled from the arm to the amount of thirty ounces. After the reduction of the hernia, he took some castor oil, and was ordered milk diet.

On the 24th he was ordered middle diet. In the evening of the 25th he began to feel severe pain in the left foot, and in the course of the night the great toe and dorsum of the left foot became much swollen, red, hot, and very painful.

On the 26th he was ordered to continue the meat diet with one pint of porter per diem,

and to take a mixture with sulphate and carbonate of magnesia twice a day.

I particularly requested that colchicum should be avoided in this case, not doubting that a moderately stimulating plan of treatment would speedily relieve the paroxysm, and the sequel of the case justified my expectations.

In the evening the pain was much less severe. To-day, Tuesday, 28th February, there is slight redness and swelling, with some tenderness of the foot. He says this attack has subsided more rapidly than any previous one. On former occasions he has always kept himself on low diet, abstained from the use of stimulating drinks, and taken *colchicum*. *He has more than once had an attack of gout after having been bled from the arm*, and he anticipated such a result on the present occasion.

Cullen gives a case very much in point. A gentleman, who was very subject to nephritic affections, had a severe illness from the renal disorder, including the urethra and bladder. He fell into hectic, as Dr. Cullen says, and when he was reduced to the lowest degree in point of strength and vigour, a fit of the gout actually came on in one foot, then went into the other, kept its ordinary duration, and went back again into the first.

There can be little doubt, from the examples which have been quoted, that the gouty paroxysm can show itself, and is even prone to do so, when the system is depressed. And it can scarcely be questioned, that the experience of most physicians, who have had opportunities of seeing this disease, will furnish them, when their attention has been called to it, with many instances of like kind.

I have remarked a peculiarity belonging to most of the cases of this kind that I have met with, namely, that the urine does not exhibit the abundant precipitate of the lithates, which so often accompanies the gouty paroxysm. In some instances there was no precipitate at all; and in others it was very slight. And the specific gravity of the urine was rather below than above the ordinary standard, indicating that no excessive quantity of either urea or lithic acid was held in solution.

We learn, from such cases, two useful cautions. The first is, that in the treatment of the gouty paroxysm, we should be careful not to reduce the patient too low, lest a new paroxysm be induced. And secondly, that in the treatment of patients of the gouty diathesis for other diseases, we should be careful to avoid carrying the antiphlogistic regimen too far, for fear of exciting a fit of the gout.

SECTION IV.

RESEMBLANCE OF THE PHENOMENA OF GOUT TO THOSE OF BLOOD-DISEASES—THEORY OF GOUT—GOUT CONNECTED WITH DEFECTIVE ASSIMILATION—GOUT HEREDITARY—LIEBIG'S THEORY UNTENABLE—NATURE OF THE GOUTY MATTER.

FROM the various points in the natural history of gout, which have been adduced in the preceding pages, it may be collected, that gout is a disease presenting the strongest points of resemblance to those in which it is admitted that a morbid agent is present in the blood. As in them, the joints suffer, the functions of the skin are impaired, the hepatic and renal secretions do not exhibit their normal characters, and certain organs are apt to be secondarily affected, the stomach, the heart, the lungs, the spinal cord, the brain, the eye. From these facts, it appears highly probable that there is a peculiar matter circulating in the blood, which gives rise to the phenomena of gout, by occasioning a disturbance of longer or shorter duration, of greater or less intensity, in the nutrition of parts to which it is attracted; the effects of this morbid matter upon any part seems proportionate to the quantity

that is drawn to the part, and when strongly attracted to one part, it is not likely to affect others. Hence in first attacks of gout in strong and healthy individuals, a single joint only is generally affected, but if anything impair the force of attraction of the morbid matter to that joint, the poison flies to other parts, which it will fix upon simultaneously or in succession.

A safe and most important rule of practice may be derived from this fact, namely, *to be very cautious about interfering with the local disturbance which a fit of the gout creates in external parts.* For such local interference, by diminishing the force of attraction of the part first affected for the gouty matter, may favour its transference to other places.

These views derive interesting confirmation from a fact to which many a gouty patient can bear testimony, namely, that a part which had previously been injured, is certain to be the seat of the gouty inflammation in subsequent attacks. If a foot or hand have been sprained, or otherwise injured, the gout will fix itself there, because the injury has exalted the nutritive process in the part, and there is therefore a greater attraction of the elements of the blood to that part, than in the state of

health*. For the essence of nutrition consists in an attraction between the solids and the fluids by which those elements of the latter which correspond in chemical constitution with the former are drawn into and appropriated by them. It is thus that albumen goes to the albuminous tissues, fibrine to the fibrinous, and so on.

It seems impossible to explain the phenomena of gout upon any other hypothesis than that which supposes the existence of a peculiar matter in the blood. We cannot regard it as a local affection; such a supposition will not explain its sudden shiftings from one place to another, nor the simultaneous affection of several joints, nor the constitutional disturbance which precedes a gouty attack; still less will it account for that train of morbid symptoms, the aggregate of which constitutes the gouty diathesis. Nor can we suppose it to be a peculiar affection of a particular class of textures, for although the fibrous textures and others connected with joints are most obnoxious to it, it by no means limits itself to them; for *all* textures and *all* parts, which the blood visits, are liable to be

* Cruveilhier states that those joints are most liable to be affected by gout which are most used.

attacked by it. Moreover, neither of these hypotheses will account for the proneness of the paroxysm to occur, as I have shewn it to do, in low and depressed states of the system.

We can, therefore, look for an exposition of the phenomena of this disease, only to that hypothesis which supposes it to result from a contaminated blood. And this opinion acquires confirmation from the two following considerations:

First: That this disease is always at first connected with defective assimilation, and imperfect excretion; two conditions eminently calculated to impair the quality of the blood, by introducing into it some abnormal element on the one hand, and obstructing the elimination of some principle which is usually excreted from it on the other. Persons in whom this disease occurs, have usually been for some time before living well, the liver has gradually become torpid, the kidneys are affected, and the skin secretes imperfectly. In some these changes may have been going on so silently and imperceptibly as not to have attracted attention until an acute attack has supervened; in others the marks and ailments which accompany the gouty diathesis will have been a sufficient indication that something is going wrong

in the system. In a person of gouty habit, as long as the molecular changes in which nutrition and secretion consist go on vigorously, a paroxysm is not likely to occur. An inflammatory or plethoric state of the system, such as may be brought on by too high living, is unfavourable to free excretion, and a depressed state of system is equally adverse to both nutrition and excretion; hence, in either of those states, the conditions may exist which would favour the accumulation of a morbid matter in the blood.

The long continuance of an imperfect assimilation cannot fail to affect, sooner or later, the nutrition of the whole body, and by and by the various tissues come to partake of the nature of the assimilated matter; if it be highly azotized, they will abound in azote; if it be deficient in this great animal principle, they must need it likewise. Nothing is more certain than that we can alter the habit of the body by the nature of the food; if we feed a man highly and work him little, or to an extent insufficient to produce a waste proportioned to the supply, we may induce the gouty diathesis and gout; if we feed him partly on azotized food, but chiefly on the non-nitrogenous articles of diet, he grows fat, and his muscles waste; if

we deprive him of fresh vegetables, although he have meat and bread, he becomes scorbutic; and it is worthy of observation, that the difficulty of removing the habit of body thus induced will be always proportionate to the duration of the mode of living by which it had been brought on.

It is a fundamental axiom indispensable to a sound and comprehensive pathology, that the pabulum of the blood is furnished from a twofold source, namely, from the food reduced in the digestive canal to *chyle*, and from the effete particles of the various tissues of the body, which are brought to it in a state of solution. The tissues which derive their nourishment from the chyle, must of course participate in its properties; if it be adulterated, they must imbibe some of the noxious material; if the spring be poisoned, they who drink of the waters must suffer. And hence it may be shown that the blood receives contamination from two sources; primarily from the morbid chyle, secondarily from the waste particles of the tissues that have been ill-nourished by this bad chyle.

Secondly: The hereditary nature of gout affords confirmation to the view of its pathology which I venture to advocate.

It has been argued by some, that the here-

ditary transmission of gout is strongly in favour of its being a disease of the solids. I am entirely at a loss to discover a single sound argument in support of this opinion. Indeed it is opposed by the analogy of all diseases known to be hereditary, for in all of them the blood is contaminated either primarily or secondarily, as in phthisis, diabetes, cancer, the hæmorrhagic diathesis. The generative act is, in its essence, one of secretion; the embryo being the result of the combination of two secretions, the one formed by the mother, the other by the father. These secretions are composed of matter separated from the blood of each parent respectively, and it is obvious that the body which results from the union of both, must partake of the properties and characters of both. And thus it is that we meet with children combining in equal proportions the qualities of both parents, while in others those of the father or of the mother predominate, as if the peculiar properties of the matter derived from one parent were such as to neutralize those from the other. The same thing appears throughout the inferior races of animals, and the breeders of horses and cattle know well how necessary it is to select both dams and sires free from blemish.

When, then, a disease is capable of being transmitted from parent to child, we may assume that it is a disease of nutrition—one in which both solids and fluids are imbued to a greater or less degree with the morbid element, and which is transmitted through the fluids—the source of all the secretions.

Now gout is primarily induced by errors of diet; these give rise to defective assimilation, from which results a contaminated blood. This, in its turn, nourishes the tissues badly, which consequently share its impurities; and they, in restoring their effete particles to the current of the circulation, again contaminate the nutrient fluid; and the secondary organic compounds, which result from the decomposition of these tissues, are of an impure kind. A person who has had a single attack of the disease (not having inherited it himself), and who, by regimen and other means, has restored the healthy nutrition of his system, would not probably transmit the disease to his offspring; but one in whom the diathesis has been fully established, even although he may have been exempt from an acute attack, must, in all probability, be the medium of conveying the seeds of this malady to his posterity.

Perhaps we cannot adduce a more striking

fact in proof of the influence which a morbid matter introduced into the blood can exert upon the subsequent nutrition of the body, than the power of vaccination, in diminishing or preventing the susceptibility of imbibing the poison of small-pox. Less than a drop of a certain fluid introduced into the blood at an early period of life, which may produce no appreciable effect beyond a slight febrile disturbance, and a single pustule, is yet capable of so modifying the whole system, that it resists the influence of a poison to which it must have succumbed, if it had not been thus protected. Nor is the protection thus obtained confined to the individual vaccinated; for recent researches render it probable that his descendants also may derive a degree of protection from the modification which the constitution of their parent underwent by the operation of the vaccine virus.

Another remarkable circumstance may be mentioned to illustrate the silent influence of contamination of the system of the parent upon the offspring, even when all signs of infection had ceased to show themselves. It now and then occurs that a woman suffers abortion at the sixth or seventh month of pregnancy; the child is dead and syphilitic:

on inquiry, both parents are free from any present symptom of the disease ; but on questioning more closely, it appears that the father had had syphilis some time before, and that the poison of that disease had never been completely eradicated from his system. The mother will not produce a healthy child until *both* she and her husband have been subjected to a course of mercury. In these cases, the offspring is tainted by a poison which lurks unperceived in the blood of one of its parents*.

These views, if well-founded, as I believe them to be, must have an important bearing on the general doctrines of disease. They seem to show that that must be a narrow and imperfect view of pathology which looks for the causes of disease in deranged solids, or in altered fluids, exclusively. The laws of nutrition forbid us to suppose that a solid can be diseased without some change occurring in the fluids ; and still more, that the fluids can be altered without the solids suffering. It is true that many a slight local disease or injury may exist without appreciable change in the fluids, and it does not follow that because we are unable to detect it,

* See a highly interesting practical paper by the late Dr. John Beatty of Dublin, in the *Transactions of the College of Physicians of Ireland*, vol. iv.

no change has occurred; but we can scarcely adduce an instance of even the slightest alteration of the fluids taking place, without the solids suffering either functionally or organically. The pathology which is most consistent with the laws of the nutritive process, as developed by the researches of modern times, may be termed a *solido-humoral* pathology.

It remains for me to inquire what may be the nature of the morbid element which is capable of so modifying nutrition, as to produce the phenomena of the gouty diathesis or the gouty paroxysm?

The frequent concurrence of a lithic acid diathesis with a gouty one, has long attracted the attention of pathologists. At the end of the last century, Mr. Murray Forbes proposed the hypothesis that gout was caused by the presence of lithic acid (then called *Lithisiac*) in the blood, which was prone to become deposited in the small vessels of tendons, ligaments, &c., under the influence of some stronger acid, either taken into the stomach or formed in the process of digestion.

That the same causes which favour the development of the lithic acid diathesis will promote the gouty one, there can be no doubt. Indolence, good-living, want of exercise, defi-

cient cutaneous action, are equally favourable to the production of both states of constitution. And it is also certain, from experience, that the lithic acid diathesis is that which passes most readily into the gouty.

But the presence of an undue quantity of lithic acid in the system, even though accompanied with the formation of a free acid, is not sufficient to account for the phenomena of gout. For we meet with many instances in which these conditions are present, even for a considerable period, without giving rise to any symptom of gout. Brickdust sediments are among the most common of those that are found in the urine; a slight disturbance of the digestive process, or a febrile cold, will increase the quantity of lithic acid; in young persons, such sediments are very common; in fevers, they appear at first in the urine, then disappear, and their reappearance sometimes seems critical. In none of these cases do symptoms of gout occur, even when the disposition to the deposit is of long duration. I have known these deposits to show themselves for weeks and months without producing any symptom of gout. In hysterical women, the lithates and lithic acid are deposited in large quantity; and in diseases of the liver, chronic as well as

acute, the proportion of this acid is very much augmented.

According to M. Becquerel, whose remarks are so consonant with my own observation, that I venture to quote them, three causes give rise to an increase in the quantity of lithic acid. 1st, fever, whatever be the organic or functional cause which occasioned it; 2nd, an intense general functional disturbance, however brought about, such as the accessions of dyspnœa in cases of pulmonary emphysema, or diseases of the heart, convulsions, delirium, &c.; 3rd, diseases of the liver, such as acute or chronic hepatitis, cancer of the liver, cirrhose*.

On the other hand, it has been shown in the preceding section that the gouty paroxysm may occur without the co-existence of an excess of lithic acid in the urine.

An adequate theory of gout must explain, 1, the frequent accompaniment of the development of a large quantity of lithic acid with the disease; 2, the occasional occurrence of gout, when this acid cannot be formed in undue quantity, as in the cases of gout appearing in low states of the system, which I have mentioned; 3, it must account for the forma-

* BECQUEREL, *Semeiotique des Urines*, p. 51.

tion of a large quantity of free acid in the system, as appears from the undue acidity of the digestive organs, and of the sweat. And lastly, it must explain the pathognomonic character of the disease, namely, the formation of lithate of soda in various parts of the body.

Liebig's theory, which has recently been advocated by Dr. Bence Jones, is certainly not sufficient to explain these points. It is affirmed that the presence of lithic acid in the system is due to the deficiency of oxygen; that in the natural state, under the influence of a due supply of oxygen, this substance nearly or altogether disappears, being decomposed by oxygen into urea and carbonic acid; so that in healthy urine its quantity is very small, and in the carnivorous animals, which are largely supplied with oxygen, it disappears altogether. The free acid, which exists in the system, is said to be lactic acid derived from the stomach, and it is further added, that this and other non-nitrogenous compounds present in the blood, attract the oxygen, and hinder its action upon the lithic acid*.

* Lithic acid, according to Liebig, is formed from blood or muscular fibre by the action of oxygen and water. For, he says, the elements of lithate of ammonia and of choleic acid, with one equivalent of water and one equivalent of oxygen, make up the formula of blood.

Were this theory true, two conclusions must flow from it. First, that under all circumstances where oxygen is abundant, lithic acid shall be absent, and urea exist. And, secondly, where oxygen is deficient, lithic acid must be present, and urea be deficient; or that in either case, the quantities of the lithic acid and urea must be in an inverse ratio.

Now, it appears from the analysis made by M. Becquerel of the urine in various diseases, that such a relation of quantity between these two important elements does not exist. He finds that in many cases of fever, the quantity of urea is very slightly diminished below the natural standard; and that the normal proportion of urea to lithic acid is but little changed. Whilst in chlorosis and anæmia, diseases where the deficiency of oxygen is obvious, lithic acid, which ought to be increased, is diminished, and in the former of those diseased states it is reduced to a minimum, and the urea is diminished also.

Again, "The uric (lithic) acid disappears in the urine of man, when he receives, through the skin and lungs, a quantity of oxygen sufficient to oxidise the products of the transformation of the tissues."—*Org. Chemistry of Physiology*, p. 139. Further, "When uric acid is subjected to the action of oxygen, it is first resolved into alloxan and urea; a new supply of oxygen acting on the alloxan, causes it to resolve itself either into oxalic acid and urea, into oxaluric and parabanic acids, or into carbonic acid and urea."—*Op. cit.*, p. 137.

In Bright's disease, in which the urea is so often diminished *in the urine*, the lithic acid ought, according to Liebig, to be increased; but such is certainly not the case in the great majority of instances; on the contrary, it is very generally much diminished. And, when we reflect on the anæmic, cachectic appearance of the class of persons who are for the most part the subjects of this disease, we cannot fail to perceive that their system is greatly deficient in oxygen; a condition, which, according to this chemist, ought to have left a considerable quantity of lithic acid undecomposed*.

Again, according to this theory, the existence of the lithates is incompatible with that of the phosphates in considerable quantity in the same urine. For the production of the latter, if Liebig's views be correct, is due to the very cause which ought to occasion the disappearance of the former, namely, an abundant supply of oxygen. But I can aver, from my own experience, that phosphates and lithates may co-exist in urine, in great abundance. In

* In herbivorous animals lithic acid is never found in the urine. In order to explain the occurrence of urea in it, notwithstanding the deficiency of lithic acid, Liebig has recourse to the hypothesis, that it may be formed in them by the action of oxygen on the blood. *Op. cit.*, p. 140. This hypothesis, however, will not apply to the case mentioned in the text.

such urine it sometimes happens that the lithates are not deposited on cooling; but the phosphates are precipitated as a cloud, which becomes greatly increased on the addition of ammonia, or by heat. Or, if instead of ammonia, a few drops of nitric acid be added, a copious precipitate takes place of lithate of ammonia, which is readily dissolved by heat.

Moreover, an excess of urea, and an excess of lithic acid ought not to exist together; but that they may so exist, I have positive proof in the urine of a patient at present under my care, which, with a specific gravity of 1030, deposits lithate of ammonia copiously, and yields nitrate of urea in large quantity immediately on the addition of nitric acid.

It is remarkable that the two classes of animals, which are most highly oxygenated, are deficient in urea, and secrete lithic acid in abundance. These are birds and insects. In the former animals, as Dr. Golding Bird has remarked, respiration is very perfect; their animal heat is superior to that of man, and their hearts pulsate much more quickly; their system must, therefore, be freely supplied with oxygen. In them, therefore, no uric acid ought to escape unchanged; yet the truth is, that the acid is excreted nearly as abundantly as in

serpents. "The semi-solid urine, which escapes from the cloaca of the jackdaw, parrot, and many other birds, contains a large proportion of urate of ammonia*."

In insects the lithate of ammonia may be seen in the Malpighian vessels, or kidneys, as many observers have found, and as I can affirm from my own observation. And, I may add, that the case of insects is still more opposed to the doctrine of Liebig than that of birds, for in them the oxygen is brought to every part of the body by the numberless ramifications of the tracheæ, and even to the walls of the tubes, by which the excretion is effected.

In the present state of our knowledge, it seems impossible to determine the correct theory of gout. It appears highly probable, however, that the peculiar gouty matter is in the first instance derived from the stomach or

* See Dr. G. BIRD's *Lectures on Urinary Deposits*, *Medical Gazette*, Feb. 1843. Dr. Bence Jones directed my attention to a passage in Berzelius, in which he states that Coindet has found urea in the urine of carnivorous birds. The guano, now so much used as manure, is the excrement of certain sea-birds, and contains lithate of ammonia in abundance. Are not these birds piscivorous? The quantity of urea present in the urine of carnivorous birds, must be so very slight, that it cannot affect the argument. Probably it exists also in the urine of granivorous birds.

duodenum, inasmuch as a disturbance of the functions of those parts is an invariable antecedent or accompaniment of the fit. And as such derangements are generally accompanied with an undue developement of lactic acid, an acid nearly resembling the acetic in its constitution and properties, it seems fair to conclude that it may be the primary disturbing agent. Again, the habits of life of those, in whom the gouty diathesis occurs, are such as to favour the generation of lithic acid. And, lastly, as the liver is deficient in its action in those cases, it may be conjectured that soda is imperfectly eliminated from the blood, and may accumulate in the circulation to unite with lithic acid, wherever that may be formed in the secondary destructive assimilating processes.

The cases, which I have adduced, of gout appearing in low states of the system, show that the morbid element of the disease may be present, independently of lithic acid, for in them this substance either did not abound, or did not exceed the normal quantity by a greater amount than may be at any time caused by a slight general disturbance.

It appears to me that we must look for the matter of gout as a compound, derived from a product of unhealthy action of the stomach

and duodenum, which being absorbed into the blood, unites there with some element of the bile which has been suffered to accumulate through the defective secretory action of the liver.

As the same causes which induce these two states, will give rise to a lithic acid diathesis, we find it usually associated with them. But the former may exist without the latter; and, therefore, gout may show itself without the occurrence at the same time, of a præternatural quantity of lithic acid.

An organic compound, such as I have conjectured, may exist in the blood in variable quantity, and for an indefinite period, contaminating the whole frame and the offspring from it, and may thus give rise to the gouty diathesis. Or, this matter, ever present in the system, may be liable to periodical accumulations, which can only be got rid of by periodical paroxysms.

SECTION V.

OF THE TREATMENT OF THE GOUTY DIATHESIS — DIET FOR GOUTY PATIENTS — DR. PHILIP'S AND MAGENDIE'S OBSERVATIONS — TREATMENT OF THE GOUTY PAROXYSM — VALUE OF COLCHICUM.

It is fortunate that experience has furnished us with excellent rules for the general management of gout, independently of those which are deducible from correct views of the pathology of the disease, or from our knowledge of its natural history.

Two problems are suggested to the physician in reference to the treatment of this malady.

First, a patient has the gouty diathesis, partly inherited, partly acquired, but never has had a regular paroxysm; to devise a mode of treatment, by which the diathesis may be altogether removed, or greatly modified.

Secondly, a patient is suffering from a fit of gout; to determine a mode of treatment, which may relieve his present sufferings, as speedily as may be compatible with the complete elimination of the gouty matter; and to propose a plan which may remove the diathesis or so far modify it, as to diminish the fre-

quency of recurrence of the fits, and ultimately cause them to cease.

That the gouty diathesis may be greatly modified, or even altogether removed, experience affords abundant proof, in opposition to the opinion of the celebrated Cullen. Indeed, it admits of alleviation, or of cure, even after it has become so far established as to have occasioned one or more paroxysms. The case of the distinguished Dr. Gregory of Edinburgh is one quite in point. Dr. Gregory was descended from a decidedly gouty family; between the ages of twenty-three and thirty he had several external attacks of gout, and occasionally gouty spasms in the stomach. By taking active exercise, avoiding all excesses, and using moderation in diet (although he did not abstain from animal food) during a period of twenty years, he so completely overcame the disposition to the disease, that all symptoms of it disappeared in the latter part of his life*.

Many instances might be quoted of men of good moral power and self-control, who, by subjecting themselves to such a system of discipline, have been enabled to pass through life free from the usual accompaniments of the

* CRAIGIE'S *Practice of Physic*, vol. ii., p. 629.

gouty diathesis; and, when a plan of this kind is begun early, and followed perseveringly, the privations, which it at first entails, are not felt, or at most, so slightly felt, that they in no way deter from a continued adherence to it. It would be out of place here to do more than make a passing allusion, to the great benefit which the adoption of a plan of this kind must confer upon the moral and intellectual, as well as upon the physical powers.

There is no disease in which the patient can do so much for himself, or in which the prescriptions of the physician are of so little avail without the full and complete co-operation of the patient, as gout.

Three objects demand especial attention in the treatment of the gouty diathesis. First, to invigorate the digestive organs, and prevent the undue formation of free acid (lactic acid) in the stomach. Secondly, to promote the elimination of the gouty matter, through the various excretions. Thirdly, to obviate the tendency to the formation of lithic acid.

I. The first object may be best attained, by careful attention on the part of the patient not to tax the stomach too severely, by too great a quantity of food, or by too much variety. A regulated system of diet is of the utmost

importance; and it would be well if gouty patients fed themselves by weight and measure, and distrusted their sensations for the regulation of the quantity of their food. I shall return to this subject again in referring to the formation of lithic acid.

If the quantity of the food be duly adjusted to the powers of the stomach, free acid is not likely to be formed in excess. Experimental physiologists have shown, that the more indigestible the food, whether by reason of its quantity or its quality, the greater will be the quantity of acid poured out by the stomach, and the more acrid will it be in quality. The sour eructations, which some dyspeptics suffer from, are produced by an unnatural quantity of acid secreted by the stomach.

It is likewise very important for the attainment of this object to attend to the hepatic function; and for two reasons; first, to provide for the neutralization of the acid developed during digestion, which, if not neutralized, may find its way into the blood, and impair the other secretions; and secondly, that the soda may be eliminated in due quantity from the blood.

If the muriatic acid, which is the predominant constituent of the gastric fluid, be derived,

as is generally admitted, from the decomposition of the muriate of soda of the blood, there would seem to exist a necessary connection between the quantity of soda set free in the circulation, and of muriatic acid secreted. For if the quantity of acid be proportionate to the quantity of muriate of soda decomposed, it is evident that the amount of free soda formed must bear a like proportion. Now, as the decomposition alluded to must take place at the capillary system of the stomach, there must be a certain quantity of free soda carried by the veins of that organ directly to the liver, from which it may be excreted as a constituent of the bile.

As there seems so evident a connection between the function of the stomach and that of the liver, we may safely conclude that the healthy action of both is necessary to perfect digestion; at least to complete chylication. If the hepatic secreting power be deficient, it is evident that the quantity of soda carried into the duodenum with the bile, cannot be sufficient to neutralize the acid of the chyme. And, on the other hand, the decomposing action of the stomach may be so great, that the quantity of soda set free may be too much to admit of being dissolved in even the healthy

quantity of bile ; in such case the neutralization of the acid of the chyme will be as imperfectly provided for as in the former one, and not only will a deranged process of chylication ensue, but also a certain quantity of free soda will be carried into the general circulation.

II. The channels through which we should endeavour to effect the elimination of the gouty matter, are the liver, the alimentary canal, the kidneys, and the skin.

For promoting the action of the liver and alimentary canal, medicines of the mercurial and purgative class are obviously important, and the free use of liquids of a non-stimulating kind, for the solution or dilution of the morbid element, may be recommended with advantage. I have frequently found that a copious draught of cold water after breakfast favours the action of the bowels, and for several years past have occasionally prescribed it with advantage for persons of costive habit.

The free use of diluents will not only favour the discharge of the morbid element by the bowels, but it will also greatly assist its elimination by the kidneys, the action of which is in general greatly promoted by copious draughts of aqueous fluids. It would be difficult to state precisely what quantity of fluid may with pro-

priety be taken in the course of the day; that this quantity, however, is much greater than is generally supposed, especially in persons liable to the generation of free acid in the stomach, must be obvious, when we consider how much water is requisite to supply the various secretions; and how much more would be needed in persons of the lithic acid diathesis, to hold that substance in solution. One precaution, however, we must not omit to press upon the attention of the dyspeptic, namely, not to dilute *at a meal, or within an hour after it*, so as to distend the stomach, for the dilution may weaken the reducing power of the gastric secretion; and the distension may prevent the secretion from being poured out in sufficient quantity.

The best diluent is pure water; toast and water may be also used, or very thin barley-water not acidulated. Soda or potass water, and the oxygenated water are, for the most part, free from objection.

The action of the skin is greatly favoured by the use of diluents; but nothing has so great an influence upon this emunctory as active exercise, carried to an extent just short of fatigue. By daily exercise, whether on foot, or on horseback, the secretion of the skin may

be greatly promoted, and those of the kidneys and of the liver likewise aided. Frequent ablution is another important method of exciting this organ. The warm or the cold bath may be advantageously used, according to circumstances; and the patient of gouty habit should have a bath in his house, and employ it daily. Along with ablution, friction should be freely used, either with the flesh brush, or with the horse-hair gloves and band lately invented. By these means the capillary circulation of the skin is freely stimulated.

The importance of careful attention to the state of the skin, may be best understood by explaining the nature of the secretions which are poured out by it. The skin is a great emunctory of water, of carbon in the shape of carbonic acid, of lactic acid, of fatty matter in the shape of sebaceous substance. In gout and rheumatic fever the superabundant lactic acid escapes from the system most freely through the cutaneous system, and therefore in these diseases, the practitioner should be careful to keep that vent open. As long as the skin secretes freely, it must aid the stomach in carrying off free acid, the liver in excreting carbon, the kidneys in separating water; and as it is the natural source for the escape of free acid, it diverts

that acid from the kidneys, where it might interfere with the elimination of lithic acid in a soluble shape. The quantity of water which the skin ought to secrete in health, during twenty-four hours, amounts to from one pint and a half to two pints, and this is very nearly equivalent to that which is separated by the kidneys. It is not difficult, then, to understand how derangement of internal organs may readily follow upon derangement of the skin.

The cutaneous surface is vastly more extensive than appears from a superficial examination of it; for besides that portion of it which forms the outer surface, it exhibits to the examination of the minute anatomist innumerable involutions of variable extent, by which its glandular apparatus is formed. This apparatus consists of glands of two kinds; one, whose office is to secrete the sweat, *sudoriferous glands*; the other, which secretes a peculiar fatty or sebaceous matter, the *sebaceous glands*. The former are composed of convoluted tubes which open upon the surface of the skin by minute pores. These orifices are easily visible by the aid of a magnifying glass on the tips of the fingers and palm of the hand, and whilst perspiration is free, minute drops of fluid may be seen to

ooze out from them. The sweat-glands are found all over the cutaneous surface in immense numbers, varying, however, in size; they are large in the palm and sole, and are very highly developed in the arm-pit. So numerous and convoluted are these tubes, that although each gland is of small size, yet if all the tubes were laid open and spread out, it cannot be doubted that they would together form a surface not inferior in extent to that of the rest of the skin.

The sebaceous glands are not so numerous; they are most abundant in the vicinity of hairs. Their form is that of small vesicular bags, which open by minute orifices into a hair follicle, or quite close to one. When sebaceous matter is suffered to accumulate in these glands, a peculiar disease of the skin is induced called *acne*, which often shows itself on the face, nose, or forehead, and very frequently on the back. In a simple form the accumulations are denoted by numerous black points, produced by particles of dust being entangled in the sebaceous matter which chokes the orifices of the glands. The skin around these will often inflame, and angry pustules result.

Nothing favours the excretion of this sebaceous matter so much as cleanliness and fric-

tion. If any additional argument were wanting to enforce the propriety of adopting means for these purposes, it is derived from the curious, and in some measure humiliating fact lately discovered by Dr. Simon of Berlin, that these glands are the habitat of a parasitic insect, which has been called the *entozoon folliculorum*. This creature is of considerable size, and may exist alone, or in clusters of several, in a single gland. In the perfectly healthy state they are few in number; but when sebaceous matter, their proper food, is suffered to accumulate, they abound. Through the kindness of my friend, Mr. Erasmus Wilson, who has lately read a paper to the Royal Society on their structure and habits, I have been enabled to see the insect alive, and had a favourable opportunity of watching its movements, as well as carefully observing its form and structure. Cleanliness and friction remove sebaceous matter, and, therefore, oppose the accumulation of those insects; and the local application of a solution of corrosive sublimate is often very beneficial in removing the points of *acne* which result from the retention of the sebaceous secretion.

Besides these secretions, the skin is continually throwing off from its surface a considerable quantity of albuminous matter, in the shape

of epidermic scales. The excretion of animal matter in this way, must evidently be promoted by frequent ablutions and by friction.

III. Not the least pressing object in the general treatment of the gouty diathesis, is to counteract the tendency to the formation of lithic acid.

For this purpose nothing is so important as a system of diet regulated as to quantity and quality.

As the quantity of food ought to be adjusted to the amount of waste that takes place in the body, it is impossible to lay down general rules respecting it. But the physician cannot pay too minute attention to the regulation of his patient's diet in this respect.

The kind of food best suited to correct the lithic acid diathesis, has been matter of controversy among men of distinction; and, as a right conclusion on this topic is of great importance, we shall briefly review some of the arguments on each side.

In the year 1819 Dr. Wilson Philip published an account of some experiments, which appeared to justify the opinion that a vegetable diet was favourable to the deposition of lithic acid, and which led him to prefer a diet composed of animal food for those afflicted with

that diathesis. He concludes "that a diet, composed of a large proportion of animal food, tends to lessen the deposition of lithic acid."

Magendie, on the other hand, looking at the highly azotized nature of lithic acid, and, also observing that those who suffer from gravel of this kind, are for the most part addicted to "*une nourriture succulent, l'habitude des tables somptueuses et des mets recherchés, et particulièrement ceux qui sont préparés avec des substances animales, en un mot, le regime des riches, amateurs de la bonne chère,*" affirmed that the great cause of the lithic acid diathesis is a regimen of too nutritious quality, composed of aliments containing a considerable quantity of azote.

Perhaps the fairest way of explaining the nature of Dr. W. Philip's experiments would be to quote two or three of them in his own words.

"**EXP. I.** A young man, about twenty years of age, in good health, and living in his usual way, partly on vegetable and partly on animal food, set apart for two days together, morning, mid-day, and evening, a certain portion of urine. All these portions at the end of forty-eight hours had deposited some lithic acid. The whole deposited from those of each day

was found to weigh one grain and a half. On the two following days he lived in the same way, except that he ate a lemon morning, mid-day, and evening. He set apart equal portions of urine. After each portion had stood forty-eight hours, the whole lithic acid deposited from the urine of each day, amounted to three grains and a half."

"EXP. III. This was made on a young man about twenty-one years of age, and in good health. On the first day of the experiment he lived wholly on vegetable substances and milk; and morning, mid-day, and evening ate a lemon. At six and at ten o'clock in the evening, he set apart portions of urine, which at the end of twenty-four hours had deposited two grains of lithic acid."

"Next day he ate no lemons, and *dined chiefly on animal food*. At the same hours he set apart the same quantities of urine. At the end of twenty-four hours, neither had deposited any lithic acid."

"EXP. IV. Was made on the same person. On the first day he lived wholly on animal food and bread with water. No urine was set apart on this day. On the next day he lived in the same manner, and morning, mid-day, and evening set apart certain portions of urine.

At the end of forty-eight hours, there was found in all of them a deposition of the phosphates, but no lithic acid.

“Having lived in his usual way for a couple of days, that the effect of the above diet might go off, on the evening of the last of these days he ate a lemon. On the following day he lived entirely on vegetable substances, except that he took a little broth at dinner. In the course of this day he ate two lemons. No urine was set apart on this day. On the following day he lived in the same way, eating a lemon morning, mid-day, and evening. At the same times of the day as in the second day of the experiment, he set apart similar portions of urine. At the end of forty-eight hours there was in all of them a deposition of lithic acid. These depositions put together amounted to about a grain and a half.”

These experiments appear to justify the conclusion that an acescent vegetable diet favours the *deposition* of lithic acid; but they do not warrant the inference which would be favourable to Liebig's views of gout, namely, that a diet of vegetables increases the quantity of lithic acid excreted. On the other hand we have no right to infer that the excretion of lithic acid is defective, from its not having been

deposited in the urine. All chemists know that a free acid, in the urine, causes the precipitation of lithic acid; what would be so likely to give rise to the developement of this free acid, as an acescent vegetable diet, of which lemon juice formed a part? Whatever be the cause of the developement of an unnatural quantity of free acid in the stomach, the same result will follow, as, indeed, Dr. Wilson Philip shows. For, in his ninth experiment, he found that a boy who lived for one day chiefly on *animal food*, felt sick towards the evening, but the urine of that day did not deposit lithic acid. On the following morning his breath had a sour smell, which infected the air of his bed-room. The urine of this morning deposited lithic acid.

From this and a previous experiment, Dr. Wilson Philip himself infers that acidity produced in the primæ viæ occasions the same effects on the urine as acid ingesta.

Dr. Philip's experiments are valuable, inasmuch as they prove distinctly that an acescent diet is favourable to the deposition of lithic acid; and it may be fairly deduced from them that a vegetable diet is more acescent than an animal one, which, however, may also occasion the generation of acid under certain circumstances.

But there is nothing, in these experiments, which would indicate that a vegetable diet is favourable to the production, or to the continuance of a lithic acid diathesis, nor does it appear to have been any part of their author's design to inquire into that question, for his observations were directed, not to the existence of lithic acid in the urine, but to its precipitation.

The object of Magendie's enquiries was to determine the influence of the food upon the quantity of lithic acid actually excreted, and the statements adduced by him certainly denote that a highly azotized diet long continued will give rise to an increased excretion of lithic acid; and this is in accordance with the observations of all practical physicians who have paid attention to the subject.

Magendie derives his conclusions from the following facts: that an excess of lithic acid occurs always in persons who indulge in the luxuries of the table, and are lovers of good cheer; that the habitual use of azotized food, in large quantities, even although there be no variety, favours the formation of lithic acid; that the disuse of these articles of diet, or the diminution of them, is effectual in removing the tendency to the excessive formation of the acid;

and that in dogs which he had fed upon gum, sugar, and other non-azotized substances, lithic acid disappeared from the urine.

The following cases, adduced by him, may be quoted as strongly corroborative of the views he advocates:—

One of his patients, who had been accustomed to good living, suffering from symptoms of gravel, thought that by avoiding variety of food he might escape from further annoyance. He accordingly confined himself to a diet which consisted exclusively of eggs and milk; but as these substances were highly azotized, his plan utterly failed.

A merchant, in one of the Hanseatic towns, enjoyed in 1814 a considerable fortune; and as he kept a sumptuous table and fared well, he became troubled with attacks of gravel. An unexpected turn of affairs deprived him of his whole fortune, and obliged him to fly to England, where he remained for some time in great distress, and suffering many and great privations. During this period, however, his *attacks of gravel left him*. Soon afterwards his affairs were re-established, and he resumed his old mode of living: *the gravel returned*. Upon a second reverse of fortune, he again lost his all, and being reduced to great distress, and

obliged to subsist upon a very meagre fare, *the gravel left him once more*; but it again returned, when on another change of affairs he had recovered his property, and had again indulged in the enjoyments of the table.

A Parisian lady, aged from 60 to 65 years, who suffered much from gravel, had read in one of the journals an erroneous statement that M. Magendie cured gravel by means of sugar. She at once determined to eat a large quantity of sugar, and frequently devoured more than a pound in the course of a day. The use of this substance compelled her to diminish considerably her other food, so as to partake of it very sparingly, or scarcely at all. She maintained this regimen for six weeks, and her gravel disappeared completely. At length she gave up the use of sugar, and resumed her previous habits, and at the end of three months her gravel returned.

That an azotized diet long continued may induce and keep up the lithic diathesis, Magendie's observations may be considered to prove conclusively, and not the least recommendation of them is derived from their correspondence with daily experience.

It is, however, a narrow view of this important subject which would refer a lithic diathesis

simply to the influence of food, overlooking that which I have called a fundamental axiom in the physiology of nutrition, namely, *that the blood is fed from a two-fold source*, from the chyle, and from the disintegration of the tissues, or, what Dr. Prout calls, their secondary destructive assimilation. Magendie, and, perhaps, also, Wilson Philip, have erred in this respect; for they have looked only to one source of lithic acid, namely, to the chyle furnished by the food; and they have disregarded entirely its formation by a secondary process. Liebig, on the other hand, has attended exclusively to the secondary formation of lithic acid, and denies altogether that the food has any immediate share in its production. He affirms, indeed, that non-azotized food favours its appearance in the urine by interfering with the action of that agent (oxygen) which causes the decomposition of lithic acid into urea.

If it be admitted that lithic acid can be formed from the decomposition of the albuminous tissues, there can be no good reason for denying that it may be likewise derived from an excess of the albuminous matter of the chyle taken into the blood, beyond what is required for the nutrition of the tissues.

The truth appears to be, that the develop-

ment of this substance may take place from the imperfect assimilation of the food, quite irrespective of the ulterior changes in the system; or it may occur from certain changes in the system, whatever may be the nature of the food. Of these facts it is most important that practitioners should be fully cognizant. How constantly do we find that a full meal, of whatever nature, produces a copious developement of lithic acid, or that a single indigestible substance, in even a moderate meal, will have the same effect! And this excess shows itself in the urine excreted within a few hours after the meal, a space of time too short to warrant the supposition that it is derived from the metamorphosed tissues; in other words, it seems most improbable that a temporary indigestion could within two or three hours so accelerate the metamorphosis of the muscular and other albuminous tissues, as to give rise to the excretion of so much lithic acid. Indeed, the distinction, which has long been made by practical men, between the *urina cibi* and the *urina sanguinis* (the former always exhibiting more proneness to deposit) indicates, at least, that the ingestion of food has a certain immediate influence upon the urinary excretion.

How frequently, on the other hand, does

it happen that the slow and silent progress of some deep-seated malady will induce a development of lithic acid to an enormous extent, quite irrespectively of the food taken; in no class of cases is this more conspicuous than where there is chronic disease of the liver.

The most remarkable example of this kind that I ever saw was in the case of a gentleman, aged sixty, of robust frame, and all his life of the most active habits, who had never previously suffered from disease of any kind. In the month of August, this gentleman began to pass lithic acid gravel, with a little bloody urine; he complained of slight pain in the back, corresponding to the base of the right lung, whence the breathing was not quite so clear as in the opposite side. This pain yielded to local treatment; but he went on from this time until his death passing enormous quantities of lithic acid; both as the amorphous deposit of lithate of ammonia, and in the shape of grains and pisiform masses of pure lithic acid. He gradually emaciated to the most extreme degree, without exhibiting any symptom which could give a clue to the more accurate determination of his disease; his sole complaint was of weakness, and of occasional pain in the right side, slightly impeding the

action of the diaphragm. His countenance assumed all the characters of malignant disease, and he died in about eight weeks from the commencement of his illness. Unfortunately, I could not obtain an examination of the body; but Dr. Bright, who frequently saw the patient, agreed with me in viewing it as an instance of deep-seated malignant disease, probably affecting the base of the right lung, or the diaphragm.

In another case, I was led, by the long continuance of similar lithic deposits, unaffected by changes of food or medicine, to search for malignant disease; this was in an hospital patient, a woman of fifty years of age. For some time she manifested no symptoms but emaciation, slight pain in the back, and copious lithic deposits of the amorphous as well as granular kind. When emaciation had greatly advanced, I was enabled to feel a hard, deep-seated tumour, connected with the head of the pancreas, or the Spigelian lobe of the liver; and the coming on of jaundice shortly before her death, confirmed my suspicions as to the seat of the tumour.

In the eleventh volume of the *Medico-Chirurgical Transactions*, the late Mr. Earle relates some cases which show that irritation of the kidney from disease in its substance, or in

neighbouring parts, may give rise to an increased excretion of lithic acid.

The conclusion respecting diet, which a fair and candid review of all the phenomena of nutrition, and of disease, would lead us to adopt, is, that that diet least promotes the lithic acid diathesis, which is most easily assimilable. Small quantities of animal food, which should be regulated by the physician according to the necessities of each individual, with smaller quantities of vegetable food, appear to answer to this description, and especial care should be taken to avoid those saccharine and other vegetable products, which may be prone to the acetous fermentation, and may therefore favour the developement of lactic acid in the stomach and duodenum.

Recent chemical discoveries appear to me to simplify greatly the solution of the question respecting diet. From these it appears, that bread, and the ordinary vegetables in use in temperate climates, contain the same azotised nutrient principles as animal food, and are therefore, of themselves sufficient to support nutrition. But to obtain the same amount of nutrient material, the ingestion of a much larger quantity of vegetable food is necessary, than of animal; and in the latter there is much less

complication of indigestible matter than in the former. Hence there seems good reason for adopting the opinion that an animal diet *regulated as to quantity*, is that most likely to conduce to the establishment of a healthy digestion.

The different kinds of beer contain in solution those principles which are most favourable to the production, and the continuance of the lithic acid diathesis. They are more or less azotised, according to the proportion of gluten they contain, and they also hold in solution a greater or less quantity of sugar. The gluten supplies material for the production of lithic acid; the sugar, for that of lactic acid, which may cause the precipitation of lithic acid. Ale and porter as containing the greatest quantity of these substances are the most unwholesome; the Indian pale ale and table-beer are the least objectionable, although even they ought to be discarded from use by the patient of gouty diathesis*.

The last point to which I shall allude in the

* Sir William Temple's description of the diet proper for a gouty patient cannot be too often quoted:—"Simple diet, limited by every man's experience to his own easy digestion, and thereby proportioning as near as well can be, the daily repairs to the daily decays of his wasting system."

treatment of the gouty diathesis, is with respect to the necessity of avoiding a plan which may lower the system too much. The cases to which I have already alluded, in which the gouty paroxysm made its appearance when the powers of the system were considerably reduced, are of great practical importance. They serve to show that an asthenic state of system is highly favourable to that excessive accumulation of the morbid element, which gives rise to the paroxysm.

It now remains for us to determine the mode of treatment best suited for the paroxysm of gout; our object being to relieve the patient's sufferings as speedily as we can, without interfering with the proper elimination of the gouty matter.

In forming a correct estimate of the value of any particular line of treatment, we must remember that the natural history of the gouty paroxysm tells us that in the vast majority of cases it tends to a spontaneous cure, and that it is itself a means for the elimination of the gouty matter from the system. These facts should teach us to be cautious; first, as to depressing the system too low, and so by impairing nutrition, favouring the developement or accumulation of new gouty matter; and,

secondly, as to ascribing to remedies that which the natural progress of the malady has effected.

The same general principles as those upon which we would direct the treatment of the gouty diathesis, are applicable to that of the gouty paroxysm. We must, in the intervals of the fits, promote the action of those emunctories, through which we would direct the elimination of the gouty matter.

Hence, moderate purgation is of great utility, as the most direct means of getting rid of such morbid matters as may be formed during digestion; and the use of such purgatives as favour the action of the liver is especially indicated; for there can be little doubt, that in most instances that organ is torpid. It is highly desirable also to promote the action of the kidneys, in order to carry off as much lithic acid as possible, through its natural outlet; and by obtaining a free perspiration from the skin, we shall favour the discharge of lactic acid, through the organ which habitually excretes it.

The purgatives which are generally the most suitable, are those of the mercurial class, blue pill for instance; and the salines, as Epsom salts, to which an antacid may be added, as

carbonate of magnesia; or tartrate of potass, which combines both purgative and antacid properties, and has also considerable power in promoting the excretion of the liver. The free use of diluents will favour the action of the kidneys, which will also be assisted by purgatives, so as to render it unnecessary, in the generality of cases, to have recourse to medicines of the diuretic class, which act more directly on the kidneys. Through the same means the skin may be stimulated to secrete more freely; or, if it can be done conveniently, the warm bath may be used, or the hot-air bath, which is of great efficacy in exciting free perspiration.

In the use of purgatives, care should be taken to employ only mild ones. Drastic purgatives should never be given, as, by the excessive irritation of the intestinal canal, which they would create, the gouty matter might be attracted to it from the external parts.

Local treatment is rarely required in the acute stage of the gouty fit; all that is necessary or desirable, is to keep the part warm, at such a temperature as may be most agreeable to the patient. Cold applications and leeching may be productive of the worst consequences,

and should therefore never be employed, except for the most urgent reasons. After the more acute signs have subsided, I have known much ease to follow warm fomentations to the part, and sometimes the lotion, recommended by Scudamore, consisting of alcohol and camphor mixture, may be applied warm, with benefit.

It is scarcely necessary to remark, that in the early periods of the paroxysm, a moderately antiphlogistic regimen should be employed; stimulants should be entirely avoided; and solid food, whether of a vegetable or animal nature, should be taken in very sparing quantities.

Colchicum has been very extensively employed in the treatment of gout: and its virtues have been greatly lauded, perhaps unduly so, by some; whilst others have been equally extravagant in their condemnation of it. I have no doubt that while, on the one hand, colchicum has often (to use the words of Dr. Holland) "borne the ill-fame of events in which it had no concern," it has, on the other, frequently got the credit of effecting cures to which it had no claim. It is curious to remark, also, that even among those who advocate its use, there is by no means an unanimity of

opinion as to the manner in which it acts; some declaring that it does no good unless it purges, whilst others maintain that it acts most beneficially when it produces no sensible effect upon the bowels.

It appears to me that colchicum may act in a twofold manner: first, *chemically*, by producing some change in the urinary and hepatic secretions, both of which it tends to increase in quantity and alter in quality; and, secondly, it acts upon the nervous system, causing more or less depression, and on the mucous membrane of the stomach and bowels, exciting nausea, or vomiting, or purging, either separately or together. If employed in such doses as will produce only its chemical changes, it will, in strong constitutions, most favourably modify the gouty paroxysm, and certainly shorten its duration. If, on the other hand, it produce any of its irritant effects, it is likely to do more harm than good: and, therefore, the dose should be diminished, or the medicine abandoned, if nausea or purging should come on during its administration. I have no doubt that a large share of the bad repute of this medicine is to be attributed to the indiscriminate and careless manner in which it is often

prescribed; and I would venture to suggest the following hints for the guidance of the practitioner in its employment.

1. Colchicum should not be given in the asthenic form of gout.

2 Colchicum should never be given at the onset of a paroxysm, nor until the bowels have been duly acted upon by mild purgatives.

3. The first doses of the medicine should be very small; they may be gradually increased.

4. Colchicum should be always administered at first uncombined with any other medicine, until the practitioner has satisfied himself that it is not likely to disagree with his patient. And indeed there is always a disadvantage in administering this medicine in combination with others; since it may become difficult, if not impossible, at times, to determine what effects should be ascribed to the colchicum, and what to the other ingredients.

5. It should not be administered so as to excite nausea, vomiting, or purging. These effects should be regarded as indicative of the unfavourable operation of the medicine.

6. Colchicum may be regarded as acting favourably, when, under its use, the urine is increased in quantity, a more abundant bile is

discharged; when the fœces, though solid, are surrounded by mucus, and the skin secretes freely.

7. The effects of colchicum should be carefully watched, as like digitalis and other medicines, it is apt to accumulate in the system.

The use of this medicine seems chiefly applicable to the sthenic form of gout, which occurs in robust constitutions, and in the prime of life; but it is almost inadmissible in persons advanced in years, who have had several attacks, and in whom the malady would seem too deeply rooted, to be influenced by the temporary administration of this remedy.

SECTION VI.

OF RHEUMATIC FEVER—ABUSE OF THE WORD RHEUMATISM—
THE RHEUMATIC DIATHESIS—HEART DISEASE OCCURRING IN
THE COURSE OF IT.

I SHALL now proceed to the consideration of the phenomena of rheumatic fever.

I employ this term in preference to that which is so often used, acute rheumatism, or acute articular rheumatism, because the word fever is more in accordance with the view of the pathology of the disease, which I believe to be the correct one; whilst the other terms seem to point to the local affection as the primary one. The articular swellings, as I hope to show, are the result of the same cause, which gives rise to the febrile movement, namely, the presence in the blood of a particular morbid element, the complete elimination of which is necessary to the perfect cure of the disease.

If this view of the pathology be correct, it is obvious that we should use no other term to denote this disease but *rheumatic fever*.

Moreover, nothing can be less satisfactory than the manner in which the word rheumatism is employed, both popularly and by medical

writers. It is applied to pains of the vaguest description, occurring in or near joints, or elsewhere, if only no other obvious cause for them be discoverable. And this use or rather abuse of the word has given rise to subdivisions, which have no foundation in an accurate pathological knowledge, into muscular rheumatism, visceral rheumatism, rheumatism of the uterus, of the periosteum, &c. These terms may or may not be correct; but I apprehend there are few practical physicians who will not agree with me in admitting, that little or nothing is known of the real nature of the affections they are intended to denote, and that the use of names in so vague a manner is more calculated to be hurtful than beneficial to medical science.

The word rheumatism had its origin in an early period of the humoral pathology, and in views of the nature of the disease which we do not advocate now; but it may be advantageously retained in our nosological nomenclature, as indicating that the real essence of the disease is to be sought for in alterations of the fluids.

I propose to direct attention to those points in the natural history of this disease which bear upon my argument.

And first let me remark, that, as in gout,

so also in reference to this disease, the constitution is liable to become modified under the influence of cold, imperfect nutrition or defective assimilation, so as to give rise to what may be called *the rheumatic diathesis*.

This state, as far as my observation enables me to judge, occurs chiefly in children and persons under the age of thirty; rarely beyond that period, excepting as the consequence of the existence of the diathesis in early life.

It is characterized by the existence of a febrile state of the system, variously developed in different individuals, and indicated by quickness of circulation, occasional exacerbations evinced by heat of skin and perspirations more or less profuse; the perspirations having a sour odour. The urine is prone to the development of lithic deposits, more or less coloured. These symptoms, however, often escape the patient's observation (although readily detected by the attentive practitioner), and his chief complaint is of pains in the joints, not always occasioning swellings or enlargements, but often impeding motion; pains also in the muscles, or in the course of the nerves of the limbs; not stationary, but now affecting one limb or joint, and again another. The real nature of these pains is, I believe, often over-

looked; and when they occur in children they are frequently regarded by nurses and others as due to the rapid growth of the child, and are popularly called "growing pains."

This diathesis is also further distinguished by evident marks of imperfect or deranged nutrition. There is great pallor of the skin; a cachectic appearance; a greenish or yellowish hue tinges the surface, and the red particles of the blood are deficient; the patient is thin; indisposed for business or amusement; the appetite fails, and some thirst is felt. The patient is keenly sensitive to vicissitudes of temperature.

I am not aware that any cutaneous disease occurs in connexion with this diathesis, as there certainly does with that of gout.

It is said that the eye becomes affected with rheumatic ophthalmia; but although much has been said and written upon this affection, its clinical history, as connected with the rheumatic diathesis, appears to be by no means clearly made out.

In this state of constitution, the heart is apt to become affected: and the constitutional disturbance consequent upon this lesion may often be the first circumstance to excite the attention of the patient or his friends. The pericardium may be, and no doubt often is, the seat of this

affection; but it has appeared to me, that in the diathesis, the endocardium and the valves of the heart more frequently suffer.

I have now so frequently met with instances of diseased heart in young persons, not traceable to an actual paroxysm of rheumatic fever, who, nevertheless, showed evident marks of a rheumatic diathesis, which had existed for a longer or shorter time, that I cannot but regard this state of constitution as a fertile source of those cardiac diseases, which are met with in early life.

One of the most striking cases of this kind, which I have met with, was in the son of a medical man, who was seen by many of the most eminent physicians in London. This lad was about thirteen years of age, and had all the symptoms of imperfect mitral valve; he died of dropsy, congested liver, and the other consequences of impeded circulation; and on examination after death, a large deposit of lymph was found in the left auricle, and on the posterior lip of the mitral valve. In this case there had been no acute attack of rheumatic fever; but for several months before the cardiac affection showed itself, he had distinctly most of the signs which I have enumerated, of the rheumatic diathesis. This case is important; be-

cause, as the father of the child was a medical man, there was no likelihood of those mistakes as regards the previous existence of the rheumatic paroxysm, which are liable to occur in the histories of ordinary patients.

The following case affords a good example of the rheumatic diathesis, producing disease of the heart:—

Frances Burkett, *ætat.* 9, admitted into King's College Hospital March 1. She has not been a healthy child, but has suffered from occasional illnesses, and particularly from coughs of great severity; she has never been subject to dyspnœa, nor to palpitation before her present attack. She has frequently complained of aching in the legs after walking for a short distance, as though she were fatigued.

Ten or twelve months ago she suffered from rheumatism, which, however, did not present the characters of a regular attack of rheumatic fever; although the pain in the joints continued for a month, she was only confined to her bed for two days, when she was very feverish and much flushed, but did not sweat. Her hands and wrists were first affected; they were very painful, and were swollen: afterwards her ankles became painful and stiff, but did not swell. None of the other joints suffered from this

attack. At the end of a month the pain left all the affected joints at once, and she recovered her usual health.

Three weeks before her admission she began to suffer from pain in the hands, with a sense of numbness: soon afterwards the ankles became painful and stiff; but, as before, did not swell. In the course of a fortnight palpitation and dyspnœa came on, with slight pain at the pit of the stomach.

When admitted she complained of pain in her joints, unaccompanied with swelling; pulse 120, small, sharp: *a loud systolic bellows'-sound was heard over the apex of the heart*: the second sound was clear and loud. She was rather thin; but had a healthy appearance.

There was lameness, with some thickening about the right ankle, for which leeches were applied: her wrist, too, was slightly swelled. Iodide of potassium was administered. In three or four days' time she was able to walk about with little difficulty.

At the end of the first fortnight she only complained of slight pain in the right hand; but the palpitation began to increase, and the action of the heart became gradually very irregular in force and in frequency.

On the 17th March, when the pains in the

joints had almost entirely left her, a *to-and-fro* sound became audible at the apex of the heart. The heart's action exhibited great irregularity; beating with a frequency sometimes of 100, sometimes not exceeding 60 in a minute: the respiration was 22, regular. She was blistered on the chest, took half a grain of calomel three times a day, and was kept in bed. Under this treatment the heart's action gradually became more regular, the systolic bellows'-sound softer and fainter, and on the 30th the second sound was clear at the apex.

It was evident that no regular paroxysm of rheumatic fever had ever occurred in this case, yet all the materials, so to speak, for its production, were manifestly present in the system. That both the mitral valves, and the pericardium were the seat of an inflammatory process, was manifest from the bellows'-sound which was heard at the apex of the heart, and the *to-and-fro* sound which became audible some days afterwards.

Under a treatment directed chiefly to improve and strengthen the constitution, with a mild course of mercury, the rheumatic affection of the joints altogether subsided, and the heart resumed its healthy action, the bellows'-sound becoming very much softer, and the friction

sound disappearing entirely; and it is not improbable that this child, under proper management, may attain a state of excellent health.

I have not met with any allusion to the occurrence of disease of the heart under these circumstances, in any of the works that I have had an opportunity of consulting. It is evidently a point of great value in the clinical history of the rheumatic diathesis, not only from the obvious bearing it has upon a correct view of the pathology of the disease; but also in a practical point of view, as showing how important it is for the practitioner to be on the watch for the signs of this state of constitution, as no doubt if it could be removed many young people might be saved from the terrible consequences of organic lesion of the heart.

Some confirmation to these views may be derived from the fact, that with chorea, (a disease of very common occurrence in debilitated or ill-nourished constitutions), disease of the heart is frequently associated, a bellows'-sound being audible at the apex or over the base of the heart, according as the disease affects the mitral or the aortic valves. Is not this cardiac disease of a rheumatic kind? I cannot doubt,

that it is so, as we have abundant evidence to prove that chorea, and the rheumatic diathesis, or even rheumatic fever, may co-exist. Drs. Copland, Prichard, and Roeser have recorded dissections of cases of rheumatic pericarditis associated with chorea*. And it cannot be questioned that the same defective or disordered nutrition which promotes the development of the latter disease, would be equally favourable to the former.

The occurrence of cardiac affection, as a feature of the rheumatic state of constitution must surely be admitted to be completely opposed to, and utterly inexplicable by the doctrine of *metastasis*, which supposes that the cardiac inflammation has been transferred from

* I may refer also to a very valuable paper by Dr. Bright, in the *Medico-Chirurgical Transactions*, vol. xxii., *Cases of Spasmodic Disease accompanying Affections of the Pericardium*. Dr. Bright's observations render it highly probable that the pericardial disease may act as an excitant to the spasmodic nervous actions. In the rheumatic diathesis the low state of the nutrient functions renders the nervous system highly susceptible of the influence of any extraordinary stimulus. The peculiar aspect which the countenance almost always assumes, when extensive pericarditis exists, seems to me to be as it were a stage of the *facies Tetanica*. It is most probably the result of a less degree of excitement than that which caused the spasmodic affection in Dr. Bright's cases. It is a true excito-motory phenomenon; and is not dependent on effusion into the pericardium, for I have known it present without such effusion.

the limbs to the heart. The truth is that the *cardiac inflammation may be primary*; it frequently exists at the same time with the articular affection, and dates its origin from the same period, as it derives it from the same cause.

SECTION VII.

OF THE RHEUMATIC PAROXYSM OR RHEUMATIC FEVER.

IT sometimes happens that a patient experiences no further ailments than those which are connected with the rheumatic diathesis, and if the heart have escaped, he may get quite well, or may be kept in good health, under proper management; or he will grow out of it as he advances in years; or the disease may fasten, as it were, upon his joints, and give rise to some degree of rigidity and stiffness. In many instances, I believe, that this diathesis may lead to a chronic destructive disease of the joints, to which I shall refer by and bye.

Frequently, however, the symptoms of the rheumatic diathesis are merely the forerunners of a more acute, and in every way a more serious affection, which constitutes what we may call the rheumatic *paroxysm* or rheumatic fever. But very frequently the febrile symptoms come on with little or no premonitory signs, or they have been of so slight a kind as to have failed in attracting the notice of either the patient or his friends.

The fever is sometimes preceded by rigors, but very frequently they do not occur; and the first symptoms are pain, stiffness, and swelling of one or more joints. The order in which the joints are attacked varies a good deal; in general, however, those of the lower extremities suffer first, and then the disease extends to the upper extremities. The hip-joint is not so frequently attacked as the other large joints: but when it is, the pain which the patient suffers is generally of the most acute kind. The large joints are more liable to be affected than the small, and the small joints of the hands and fingers are more frequently attacked than those of the feet.

In a short time the joints swell to a greater or less degree, and the skin on their exterior exhibits some degree of redness. The swelling is owing partly to the effusion of fluid into the cellular tissue around the joint, and partly to effusion into the synovial membrane; it rarely, if ever, happens that there is not some effusion into one or the other, and that into the synovial membrane is very frequent, and often very considerable, so as completely to distend the sac. The extent of such effusions can be best estimated in the knee-joint, because its anterior surface is so little covered, that the

accumulated fluid causes a considerable projection above the patella and on each side of its ligament. The swollen joints are all exquisitely painful, and the slightest movement produces intense agony.

The most remarkable phenomenon in this disease is the fever; it differs greatly from that which accompanies local disease. The face is flushed, the skin hot, and there are profuse perspirations exhaling a peculiarly sour smell, disagreeable to the patient himself as well as to the bystanders; and it has been always remarked, that the perspirations do not give relief to the pains. An exacerbation always occurs at night, and the pains are increased at that time. The appearance of the tongue, when the fever is fully developed, is very characteristic, it is moist and soft, and covered with a very thick white fur, such as is rarely seen in any other form of fever with which I am acquainted. Thirst is much complained of.

The urine is scanty and remarkably high-coloured, strongly acid, and deposits an abundant sediment, of a deep colour, consisting of lithates and purpurates of ammonia; its specific gravity is high, the quantity of lithic acid is increased, while that of urea is nearly

normal. M. Becquerel mentions a curious circumstance respecting the urine in this disease, which the advocates of large bleedings will do well to consider; it is this, that immediately after a large bleeding the urine assumes for a brief period the characters of that in cases of anæmia.

The pulse, in this fever, is full and bounding, but not strong; in very many instances it is compressible. The pulse of an artery leading to a rheumatic wrist is much fuller than that of one where the wrist is free from disease. The character of the pulse is not sthenic; a similar one occurs in forms of disease universally acknowledged to be *asthenic*, in delirium tremens for instance. It is the pulse of an artery, the middle coat of which is deficient in tone, and which affords but a feeble resistance to the pressure of the heart.

The blood becomes almost uniformly buffed and cupped after standing a short time, the coagulum being generally firm. As Sydenham remarked, it is extremely like the blood of pleuritic patients; but it differs from it in this, that while the pleuritic blood will cease to be cupped and buffed, the rheumatic blood will exhibit the buffy coat, however frequently you may bleed. It is generally stated, that the

proportion of fibrine in the blood is much increased. As to the proportion of the red corpuscles, I should say that it must be considerably diminished, judging from the peculiar anæmic appearance which patients in rheumatic fever exhibit after the first few days, and the long time they require (especially if bleeding have been carried to any extent) to recover anything like a healthy look. I imagine that the anæmic appearance, independently of the influence of blood-letting, is an important feature of the disease, as affording proof of how completely the nutritive phenomena in the blood are arrested. It is a character which this disease possesses in common with some others, the pathology of which is akin to it, Ague, and Bright's disease, for instance*.

The skin, in the highest point of the fever, is affected with various forms of eruption. That which I have most frequently seen, consists of a copious crop of extremely minute miliary vesicles, identical with the sudamina which are often met with in typhus fever; and these occur in cases where the sweating is

* I take this opportunity of recommending to the attention of the profession a most important paper on the blood, by my friend Dr. G. O. Rees, which has only come into my hands while these pages are passing through the press.—See *Guy's Hospital Reports*, April, 1843.

extreme. I have also seen urticaria, and more frequently various forms of erythema. An eruption resembling erythema nodosum, and occurring chiefly or exclusively on the lower limbs, I have occasionally witnessed, and also the erythema tuberculatum of Bateman. These eruptions generally make their appearance on an early day after the seizure, and quickly subside.

The affections of the joints present the remarkable feature of shifting from one joint to another with great rapidity. The joint that is affected to-day will be nearly free from pain and swelling to-morrow, and then some other joint will be attacked; this will be abandoned, and the first one revisited; and so joint after joint will be affected and abandoned in turn, and apparently in the most capricious manner. The joints thus attacked are seldom permanently injured, unless the disease have remained in them for some time. And it is an important and a well-established fact, that the affection of the joint very rarely induces suppuration or acute destruction of the cartilage. There can be little doubt, as Chomel and others have suggested, that most of the recorded cases in which this result was supposed to have followed rheumatic fever, must have been examples of infection of the blood by pus.

In the course of this disease, as in gout, certain internal parts may become affected. In that disease, however, the morbid matter often deserts the external parts, when it fixes upon the internal. The gouty matter, in good states of constitution, is not prone to shift; but if it seize upon a new part, the attraction to the first soon becomes weakened. Not so in rheumatic fever; in this disease a great number of parts may be affected at once, and an internal organ may suffer at the same time with them, so that here there is no true metastasis. Of all the internal parts the heart is most frequently affected, either on its outer or inner membrane; and the disease of this organ, which is apparently of inflammatory kind, never tends to suppuration; but terminates either by the deposition of lymph, or the effusion of water into the pericardial bag. In some instances, where the heart affection was very extensive and serious, I have remarked that the limbs were free, as if the strong attraction to the heart overcame that to the joints.

Dr. Graves affirms, that the rheumatic fever may exist without the articular affection; and that pericarditis may occur as a primary symptom, before the appearance of the articular

swellings. He says, "In truth, in rheumatic fever, the quickness of the pulse, heat of the skin, tendency to profuse sweating, debility, restlessness, and thirst, may all exist, without any inflammation of the joints, and may be resolved without such inflammation ever occurring, as I have witnessed in several well marked cases of individuals liable to rheumatic fever, and who had previously suffered from attacks of fever with arthritis in the usual form, and subsequently, on exposure to cold, were seized with symptoms of pyrexia, which in intensity, duration, and every other particular, were identical with their former fevers, save and except that from beginning to end not a single joint was inflamed*." I have not met with such cases; but I have frequently been struck with the disproportion of intensity of the articular affection to that of the fever, the former being trifling in amount, whilst the latter was of great severity.

Again, the disease may fall upon the pleura, or upon the peritoneum, or it may affect the brain.

In the last case, however, it rarely if ever happens that organic mischief is produced; and

* *Clinical Medicine*, p. 914.

the attack, although formidable in appearance, is easily controlled. I believe it invariably occurs only in those cases where bleeding had previously been employed. It is, to use the expression of Dr. Gooch, as applied to a form of puerperal mania, "*a disease not of congestion or inflammation, but one of excitement without power.*" And, in instances, when it does not arise from the depletion employed for the cure, it may, perhaps, be attributable to that impoverished state of the blood resulting from the cessation or imperfection of its nutrient changes, which appears to be a characteristic feature of the rheumatic diathesis and paroxysm.

There are two more points connected with the natural history of rheumatic fever, which I must notice.

The first is, that a single attack of the disease so fully establishes the diathesis, that the patient is ever after very liable to similar attacks, and in this respect it resembles gout and ague; but in rheumatic fever there is this mitigating feature, that a second or subsequent attack is generally milder than the first or previous ones. It is obviously of importance to bear in mind this latter circumstance, in forming an opinion as to the efficacy of different modes of treatment.

The second is, that there appear good grounds for regarding the rheumatic diathesis as hereditary. Of seventy-two patients questioned by Chomel relative to this point, thirty-six were born of parents who had been rheumatic. And the children of gouty parents are more liable to this disease than those who have sprung from an untainted source.

SECTION VIII.

RESEMBLANCE OF THE PHENOMENA OF THE RHEUMATIC DIATHESIS AND FEVER TO THOSE OF BLOOD-DISEASES—COMPARISON OF THEM WITH THOSE OF PURULENT INFECTION AND GLANDERS—THEORY OF THE RHEUMATIC DIATHESIS AND PAROXYSM—THE CAPSULAR RHEUMATISM OF MACLEOD IS GOUT—NATURE OF THE RHEUMATIC MATTER.

IN reviewing the leading phenomena of the rheumatic paroxysm, it is impossible not to perceive a resemblance of the most marked kind to some of those diseases which I described in my first Lecture, and which are confessedly due to the introduction of a morbid material into the blood. In the first place the fever partakes of the irritative nature, which is the leading character of that which precedes the cutaneous eruption in the exanthemata; nor, as in those diseases, is that fever relieved until the morbid element which gives rise to it, has, as it were, spent its fury on the textures to which it is attracted.

Again, there are two diseases, to the earlier stages of which it presents a still more striking resemblance. These are infection of the blood by pus (from phlebitis or any other cause), and glanders. Those formidable cases of puru-

lent infection, which constitute a fearful variety of puerperal fever, have frequently been set down as rheumatic fever; and indeed some of the cases so vauntingly adduced by M. Bouillaud, in proof of his assertion, that suppuration is a frequent consequent of the rheumatic paroxysm, are of this kind, and are so obviously connected with the puerperal state, that he proposes to designate them by the title *arthrite rheumatismale puerperale*. Dr. Ferguson has shown that in the puerperal state, the causes which tend to vitiate the blood are particularly rife. "The woman," says Cruveilhier, "presents the faithful picture of one who has undergone a severe surgical operation. The internal surface of the womb may be compared to a vast solution of continuity. The whole of the mucous membrane has been altered by the inflammation, of which it has been the seat. The gaping veins are like the open-mouthed vessels of the stump of an amputated limb*."

And cases occur which do not run a very rapid course, and in which it is not easy to distinguish between the true rheumatic fever and

* Dr. Ferguson's remarks on the influence of uterine injury in the production of puerperal fever, deserve an attentive perusal.—*Essays on the most important Diseases of Women*, part i., p. 104.

the puerperal disease. I find a case of this kind noted in my Hospital Case-Book; and I may add, that the medical gentleman* who attended the patient, and afterwards sent her to the hospital, and who evidently experienced at first a difficulty in distinguishing between the rheumatic and the puerperal disease, is a man of excellent discrimination and acquirements and of great experience. I quote the notes of the case, as preserved by my clinical clerk at the time.

“The age of the patient was 23. The history given of her by her medical attendant is, that six weeks before her admission she had a severe and protracted labour, and the child was still-born. She took cold in consequence of the very uncomfortable and exposed room in which she was confined, and had *what appeared to be a rheumatic attack* after delivery. He had some apprehension that the veins of the left side were also affected.”

The appearance of this poor woman on her admission was that of a person labouring under an extreme attack of rheumatic fever, assuming the typhoid type; but we soon discovered that the swellings of her large joints arose from the

* Mr. Dunn, of Norfolk Street, Strand.

effusion of pus into them, and the destruction of their cartilages.

To illustrate this matter further, I shall quote a striking passage from an excellent paper by my friend Dr. Thomas Beatty, Professor of Midwifery to the College of Surgeons in Dublin, on purulent effusions into the joints in puerperal woman. In describing the symptoms which usher in this formidable affection, Dr. Beatty says; "The symptoms which accompany the early stage usually commence within a few days after delivery, and consist of severe pain, tumefaction, and sometimes redness of one or more of the large joints, together with intense fever, loss of appetite, and great thirst; and occasionally, but not always, pain and tenderness in the lower part of the abdomen. The absence of the last symptom leaves the case *with a strong resemblance to acute rheumatism, for which I have known it to be mistaken*; and this has led me to suppose that some cases described as the latter, and terminating fatally in puerperal women, were instances of this disease; and it thus accounts for the horror of rheumatism in lying-in patients which I have heard sometimes expressed*."

* *Dublin Journal*, vol. 16.

In glanders, too, the early symptoms resemble those of rheumatic fever; pains and swellings of the large joints, with copious perspirations of offensive odour, are among the earlier symptoms: and, in a well marked case of the disease, recorded by Dr. Williams, of St. Thomas's Hospital (*antè* p. 17), the patient was believed for a time to have laboured under rheumatic fever.

The existence of a peculiar diathesis of the rheumatic kind, limited to the earlier periods of life, the many points of resemblance and analogy between this disease and gout, in all their forms and varieties, (so many, indeed, and so striking, that the diagnosis is often a matter of great difficulty, and frequently one of doubt; and that Chomel has gone so far as to affirm the identity of the two maladies,) the liability to the recurrence of the disease to which those who have been once attacked, are exposed; the hereditary nature of the malady; all these points are strongly in favour of the opinion that in this disease general nutrition is disturbed, not by mere local disease, nor by an impression on the nervous system, but by the developement of a morbid matter in the blood, which visits every part to which that fluid is distributed, but which is attracted by some textures much more than by others.

We owe to the sagacity and industry of my friends Mr. James Paget, and Dr. William Budd of Bristol, the knowledge of a highly curious law, which appears to influence affections, traceable to the modification of nutrition, to which I allude. All practical men are familiar with the chronic pains which ensue upon the rheumatic paroxysm, and which often retard the perfect convalescence of the patient. Those pains generally affect parts symmetrically disposed; the right and left shoulders; the right and left knees: in Dr. Budd's words, "the affection of one limb repeats itself in the fellow limb, not merely with a general correspondence of situation, but joint for joint; bursa for bursa; sheath for sheath."

That similar phenomena occur in a vast variety of affections, clearly traceable to a diseased state of nutrition, is amply proved, and ably illustrated in the excellent papers by the gentlemen above named, in the last volume of the *Medico-Chirurgical Transactions*, on diseases which affect corresponding parts of the body in a symmetrical manner.

And, now let me say a few words in reference to the hypothesis, which some have advocated, that the rheumatic fever is merely symptomatic of a local inflammation affecting one

or more joints. Such an hypothesis is very far from affording a satisfactory explanation of the phenomena.

1. It will not explain the peculiar diathesis, nor the limitation to a certain period of life. In the diathesis the constitutional disturbance is often beyond all proportion greater than the local affection; so that in some instances the latter is overlooked, or attributed to a wrong cause, in the anxiety that is excited by the altered appearance, imperfect nutrition of the patient, or until some vital part is touched, as the heart, the functions of which become impaired. And in the paroxysm of rheumatic fever, as I have already stated, the constitutional disturbance is frequently far greater than can be accounted for by the local mischief; and, as Dr. Graves has shown, may exist without any affection of the joints at all.

2. It will not account for the affection of the heart. It is true that we meet with instances where a local malady will give rise to affection of some distant part; but when this is the case, the secondary affection is similar to the primary one. Thus cancer at one part, will produce cancer in another. But in rheumatism, on this hypothesis, we should find an affection of the heart, which essentially consists

in the effusion of coagulable lymph, produced by an articular disease showing no such sign.

3. I repeat, that we have no satisfactory evidence that the articular affections are truly of the nature of ordinary inflammation. The parts are certainly swollen, painful, and there is a considerable flow of blood to them; but they do not suffer even from the effusion of coagulable lymph; much less are they the subject of those destructive and disorganizing processes which so often follow in the wake of a true inflammation. Nor is it the nature of a true inflammation to desert quickly one part, leaving it unimpaired, and to fasten upon another, and after making a short sojourn there, to revisit its old abode, or fly to some new region. It is true that, in some instances, the joints do not escape unharmed, but a slow derangement of their nutrition is induced,—which may go on for years and years,—which alters the textures, and even allows them to wear away, and which resists those remedies that usually check an inflammatory process. This, although often called inflammation of chronic kind, is surely more like the slow and insidious working of a canker, which dries up, or impairs the matter destined for the nourishment of the tissues.

I do not, however, wish to be understood as denying that the ordinary effects of inflammation may take place in rheumatic joints. I am bound to admit that some cases are on record which seem to partake of this nature: but such instances are extremely rare; and their occurrence does not invalidate my argument; on the contrary, here *exceptio probat regulam*. In these cases the poison has been more strongly attracted to a particular joint or joints, and others have consequently suffered less; and the remarkable disposition which the rheumatic affection has to shift from joint to joint is absent.

4. Let us compare with the rheumatic paroxysm the constitutional disturbance, which an undoubted inflammation of ordinary kind affecting a joint creates, when not connected with a constitutional taint.

In the latter case the fever is always directly proportioned to the local disturbance. The pain in the joint, and the difficulty of using it, are the first and chief objects of the patient's attention; and it is not until the destructive inflammation has proceeded to a great length, that his constitution begins to suffer, and the febrile disturbance threatens to wear him out. The amputating knife, by removing the source of irritation, speedily puts a stop to the fever;

and it often happens, that the night after an operation of this kind proves the first one of rest and refreshing sleep which the patient has enjoyed for many weeks. How different is this description from that of the irritative fever of the rheumatic paroxysm! Were a rheumatic limb to be amputated, how different would be the surgeon's account of his patient!

5. But it may be said, you cannot deny that inflammation of the heart exists; for there you have the products of inflammation in abundance. May we not infer, that because the heart is inflamed the joints must be so likewise, and that lymph is effused in them also, which subsequently becomes absorbed? To this I reply, that the heart is very differently circumstanced from the joints; these are rendered absolutely incapable of motion, whilst that is moving with even more vigour and rapidity than usual, contracting with energy, and occasioning a considerable amount of friction between the opposed surfaces of its serous membrane. Surely these are conditions more likely to excite inflammation, especially if an irritant fluid be in contact, than the absolute rest to which the joints are of necessity condemned. Doubtless if the joints could be freely used

during the paroxysm, they would more frequently exhibit marks of destructive inflammation, as a consequence of the rheumatic paroxysm*. Moreover, the heart may be said to be bathed in blood; for not only are its cavities filled with this fluid, but its exterior is surrounded by moisture derived from the serum, which doubtless contains the essence of any morbid element the latter may hold in solution; and, besides all this, the very substance of the heart is permeated by blood-vessels, which ramify to a degree of minuteness, of which no one can form an adequate conception, who has not had the opportunity of examining a minutely injected specimen with the aid of the microscope.

Lastly, it has been said that this is an inflammation of the fibrous system; and the weight and authority of the great name of Bichat, have tended greatly to propagate this error. But so little satisfactory is this theory, that some practical physicians have endeavoured to make a distinction between what they call synovial or bursal rheumatism, and fibrous rheumatism. The natural history of the disease, however, does not warrant this distinction; for in no instances of rheumatic fever, are the synovial membranes free from irritation—as evinced

* See Dr. CORRIGAN's paper in the *Dublin Journal*, vol. xvi.

by the existence of effusions; and the synovial membranes can scarcely be affected without involving the fibrous tissues which surround, support, and convey the blood-vessels to them.

It is true that there are certain cases which must be carefully distinguished from rheumatic fever, and which exhibit a very different train of symptoms. But in them, although the effusions into the synovial membranes are sometimes more considerable than in rheumatic fever, there is no evidence that these membranes are more affected than the fibrous. I suspect Dr. Macleod felt this to be the case when he adopted the term "*Capsular Rheumatism*," to designate this form of disease. Dr. Macleod* admits that this disease "is, in various respects, very closely allied" to gout; and I cannot avoid expressing my opinion, with every respect for that of a physician of Dr. Macleod's large experience, that the two diseases are identical; and the following characters, which, although perfectly familiar within my own practice, I take from his description, appear to me to justify this opinion.

1. The parts most liable to its attacks are the feet and hands; but it attacks the large joints also.

* *On Rheumatism*, p. 92.

2. The articular affection is less fleeting than in rheumatic fever, and does not attack so many joints at a time.

3. It occasions distortions of the small joints of the hand and foot: (it differs, however, from the disease described by Dr. Haygarth, under the title of nodosity of the joints*.)

4. The surface of the articular cartilages is sometimes sprinkled over with a white powder, which was found by Dr. Chambers to be carbonate of lime, and by Dr. Macleod to be lithate of soda, both of which deposits take place in gout, but never in true rheumatic fever.

5. The disease is apt to recur as gout does, that is, very frequently, the later attacks being worse than the earlier ones.

6. It is very amenable to colchicum, which exerts its influence upon it just as upon gout.

7. "It has very little [qu. no] disposition to implicate the heart."

These particulars, coinciding, as they do, so strikingly with the natural history of gout, appear to me to denote clearly that the disease in question has, at least, more of the gouty than of the rheumatic character.

I admit, however, that the fibrous system

* See the section on Chronic Rheumatism of the Joints.

is extensively affected in both gouty and rheumatic diseases. But it is a very partial and erroneous view, which would limit the affected tissues to those of the fibrous class. The textures which are most frequently affected in these diseases are, the white fibrous, the synovial, the cartilaginous, the cutaneous, the serous, and the osseous. And it is not unimportant to remark, that all these tissues belong to the gelatinous and albuminous classes, and are chiefly composed of those proximate elements, from the decomposition of which, in the wear of the system, those great secondary organic compounds, urea and lithic acid and lactic acid, are produced. It is perfectly consistent with sound theory to suppose that these tissues are capable of exerting a special attraction on the gouty or rheumatic element, and this quite irrespectively of any anatomical explanation which might be offered.

I now proceed to inquire into the nature of the morbid matter, which I think we may infer to be the cause of the rheumatic diathesis, as well as of rheumatic fever.

This is even a more difficult inquiry than that regarding the matter of gout. In the latter disease, we had some guide in the actual excretion of a peculiar substance, *lithate of*

soda, from the diseased parts. But there is nothing of this kind in the disease which we are now discussing.

The remarkable resemblance, however, between the two diseases, may justify our concluding, that a certain similarity of composition may exist between the morbid matter of each. By contrasting the characters of the excretions in both, and eliminating such features of the gouty ones, as are not met with in the rheumatic, we may arrive at some approximation to the true nature of the rheumatic matter. The two most remarkable excretions in the rheumatic diathesis, or fever, are the urine and the sweat. Both of these are distinguished by the presence of an unusual quantity of free acid. The urine contains a large proportion of lithic acid; and those highly coloured deposits take place in it, which Dr. Prout supposes to arise from the formation of purpurates. The lithic acid diathesis, however, is by no means so strongly marked in the rheumatic as in the gouty state; and these excessive deposits of lithates are more to be regarded, as belonging to the paroxysms, than as constant concomitants of the diathesis. The high colour of these deposits is more marked in rheumatism than in gout. The sweat of rheumatism is

much more copious than that of gout, and is evidently much more acid. In the latter disease, indeed, sweating is generally absent. Lithate of soda is never formed in the rheumatic paroxysm, nor in the diathesis,—and those derangements in the biliary system, which so often occur in gout, are not so apparent in rheumatism.

If with these considerations we take into account the most frequent causes of the rheumatic diathesis and paroxysm, we shall obtain a further clue to the determination of the problem we have proposed. These causes must be admitted to be imperfect assimilation and vicissitudes of temperature,—and hence the ill-clad and badly-fed children of the poor are the most numerous victims of rheumatism. Hard work, exposure to cold and wet, bad food, are strongly contrasted as causes of the rheumatic diathesis, with the ease, comfort, and excess which give rise to the analogous one of gout. If now, we remember that the skin is the great emunctory of lactic acid, and that bad food, or too little food, may give rise to its undue developement as well as too much food, it is no wonder that, as lactic acid is imperfectly excreted, through its natural channel, in consequence of the influence of cold in checking perspirations, and is too freely deve-

loped in the alimentary canal, it should accumulate in the blood and become eliminated at every point. Moreover, the long continuance of the causes, which produce the defective cutaneous secretion, and the deranged gastric one, will give rise to the undue development of the lactic acid, in the secondary destructive assimilating processes, thus infecting the blood from every source, and tending to perpetuate the diathesis.

Such is the theory of the rheumatic diathesis and paroxysm which seems most consonant with the facts supplied to us by the investigation of the natural history of the disease, and with the present state of our knowledge of animal chemistry; and the adoption of it, if only for a temporary purpose, will at least serve to stimulate a closer inquiry into the pathology of a disease which, although not a fatal one, is yet most disastrous in its consequences.

It is no mean recommendation of this hypothesis to say of it, that it is that which is in accordance with the views of Dr. Prout. "On these suppositions," says this physician, "we may explain the formation of the large quantities of lactic acid usually present in rheumatic affections, as well as the swelling, &c.; for as

all the organs are more or less involved, and their functions paralyzed, not only imperfect assimilation takes place in the part affected, but the apparatus destined to remove matters, which are unfitted, or no longer useful, from the scene of operation, likewise cease to act; and hence such unfitted and useless matters accumulate, and cause swelling in the part affected."

I should be doing injustice to my own feelings were I, on the present occasion, and in this theatre, to mention the name of Dr. Prout without giving expression, feeble though it necessarily be, to the admiration and gratitude which I entertain towards that distinguished man. Nor can I doubt that with these feelings all will cordially sympathize, who study their profession under a deep sense of the serious responsibility which attaches to the practice of the healing art; for doubtless they, like myself, must have experienced the greatest assistance from his labours. I hesitate not to assert, that no one, of the present or of past generations, has done more than Dr. Prout to establish a sound and rational system of pathology; and while we neglect not to do full justice to the real merits of distinguished foreigners, let us not forget, that there lives amongst us a philo-

sopher and a physician whom posterity will delight to honour, along with Harvey and Hunter, as one of the greatest benefactors to medical science.

SECTION IX.

MAY THE UNHEALTHY SECRETIONS OF THE UTERUS AFFORD
MATERIAL FOR THE PRODUCTION OF RHEUMATIC MATTER?

It has been shown in the preceding pages, that when the blood is infected by certain foreign matters, symptoms are induced resembling those of a gouty or rheumatic kind. In some cases these are chronic, and induce a state of constitution which resembles the gouty or the rheumatic diathesis; in others they are of a more acute kind, and may be likened to the phenomena of rheumatic fever. From what has been stated, there seems good reason to believe that, in both gout and rheumatism, the morbid matters are primarily derived from a defect in that part of the digestive process, which is performed by the stomach and duodenum, collateral circumstances determining whether they are to produce phenomena referrible to gout, or to give rise to the train of symptoms which may be designated rheumatic.

The following case, which came under my observation last year, strongly impressed me with the idea that the secretions of the uterus,

if of an unhealthy character, and not duly thrown off, may be absorbed into the circulation, and contaminate the blood, producing symptoms of greater or less urgency, according to the nature and quantity of the morbid secretion which may have been absorbed.

The case recalled to my mind others in which a condition, resembling the rheumatic or gouty diathesis, appeared to be connected with an unhealthy state of the uterus; and, in conversing with my friend Dr. Rigby on the subject, he mentioned to me some instances of a similar kind, which had occurred in his practice; and he has very kindly furnished me with some particulars respecting them.

In the present imperfect state of my observations in reference to this subject, I cannot do more than propose as a query, with a view to direct the attention of others to it, whether, under certain circumstances, the uterus may not be regarded as a source of rheumatic or arthritic matter?

When we reflect that, in the puerperal state, the secretions of the uterus frequently prove a fertile means of vitiating the blood, and of giving rise to the formidable symptoms of puerperal fever, it seems not improbable that the unhealthy secretions of the unimpreg-

nated uterus, if retained, may also contaminate the blood, and produce symptoms of an analogous, although a much less formidable, kind. Without further preface, I shall now relate the highly interesting case above alluded to.

Amelia Trevis, ætat. 23, a strong-looking woman, unmarried, of rather plethoric habit, was admitted into the King's College Hospital on the 13th of June, 1842. She had lived in the country all her life, until twelve months before her admission, when she came to service in London. In the country she appears to have suffered from what she called rheumatic pains; but with that exception, she enjoyed good health until she came to London. For three months before her admission she had not menstruated; her general health was bad; she had loss of appetite; and felt weak and unable to work; and could not sleep well.

Six weeks before she came to the hospital, she began to suffer from severe shooting pains in the pelvis; these used to affect her most severely when she was walking, and they were often so severe as to oblige her to stop and sit down. She attributes these pains to having caught cold just before her catamenial period, and to having much to do in washing with cold water. She was now seized with flooding,

passing large clots of a dark colour. This was accompanied with feverish heats and chills, and with perspiration.

Five days after this attack she began again to suffer from uterine pains; another attack of hæmorrhage came on; she was feverish; and the quantity of urine diminished considerably.

She was admitted, complaining of these uterine pains, felt most in the back, about the hips, and down the outside of the thighs. She was very weak, and had little or no colour; the hypogastric region was very tender, urine scanty, and micturition difficult. Slight discharge from the uterus.

She continued in the hospital for upwards of a month, with her symptoms very little mended, excepting that her general health was improved by tonics, good diet, and rest. Her constant complaint was of uterine pain; and I was led to view her case as one of those of irritable uterus, described by Dr. Gooch. During this period *she suffered occasionally from rheumatic pains in her shoulders and other joints.* She left the hospital on the 19th of July.

This patient returned to the hospital on the 21st September, complaining of great pain in the region of the uterus, and extreme hypogastric

tenderness; her pallor had increased; and her health seemed much worse than on her previous admission. The catamenia did not appear at the usual time, and there was slight uterine discharge, with severe bearing-down pain; frequent and difficult micturition; she also suffered from pain in the hips, and down the thighs. She continued in this state for six weeks, notwithstanding the various measures which were employed for her relief, and I began to despair of doing her any good; when on the 8th of November she was found complaining of stiffness of her joints, preceded by rigor, and accompanied with profuse perspirations.

In short, a severe attack of rheumatic fever now set in, with a considerable number of erythematous papulæ, and patches upon the skin over the body, lower extremities, and the face. The fever, at first, assumed very much the character of one preceding small-pox; my suspicions of which, were, for a time, excited by the appearance of the papulæ.

She went through the rheumatic paroxysm favourably; but the fever was of so low a tendency after the first few days, that I was obliged to give her wine, by which she benefitted greatly.

In three weeks from the commencement

of this attack, this young woman left the hospital quite well, having completely lost all her uterine pains. I saw her about a month afterwards, and she continued quite well.

In this case there appears to have been an obvious connexion between the state of the womb, and the rheumatic paroxysm, the outbreak of which removed all the uterine symptoms. The fever had all the appearance of one produced by the introduction of a morbid matter; it was of a low kind, and the skin was covered with erythematous spots, denoting a highly irritant condition of the blood. The digestive organs had shown no signs of material derangement previous to the paroxysm, and the part which seemed chiefly to suffer was the uterus. Seeing that this organ, which had suffered for so long a time previously, was immediately relieved by that free discharge of morbid matter, which necessarily took place in the rheumatic fever, I was led to recognize the connexion of the deranged state of uterus with it, as cause to effect, and the relief to the organ by the febrile paroxysm, as analogous to the removal of dyspeptic symptoms by a fit of the gout.

Doubtless if we had been able to ease the uterine disturbance, and promote the menstrual

flux, the rheumatic fever would not have occurred. I have observed what seems quite similar in some cases of what is called gonorrhœal rheumatism. If an effectual cure to the gonorrhœa can be accomplished, the articular pains will cease; but as long as the urethral discharge (the source of the virus which infects the blood) continues, the rheumatic affection does not yield. In such cases, an acute paroxysm would probably effectually lead to the removal of both the urethral discharge, and the articular affection; but I have never met with any instance of this kind.

In dysmenorrhœa there must be a condition of the inner surface of the uterus, more or less resembling that which follows parturition. In some cases, it is well known that a deciduous membrane has been thrown off; in others, again, secretions accumulate and cause enlargement and distension of the organ, like those consequent upon pregnancy. Here are states, highly favourable for the production of a depraved secretion, which being in contact with an absorbent surface, may readily enter the blood and contaminate it.

That the state of the uterus exerts a considerable power over the female system, is proved by many facts which I need not now enumerate,

I shall content myself with referring to the remarkable influence of the chlorotic state upon healthy sanguification. In chlorosis the blood is strikingly deficient in its colouring matter, as well as in all those elements on which healthy nutrition depends. It would seem as if, in this state, the proper chemical changes of the vital fluid were to a great extent arrested, and the solids of the body suffered as a natural consequence; and all this, in effect of the absence of a process by which an excretion is discharged from the uterus once in every month*.

It is true, that in some cases of chlorosis the constitutional debility may precede, and give rise to, the defective uterine action; but I apprehend, that in most instances the local malady, whatever may be its cause, is not only antecedent to, but the cause of all those phenomena so characteristic of the chlorotic state.

The severe constitutional disturbance which sometimes follows sudden arrest of the catamenial discharge, clearly points to the great importance of this evacuation, and calls to mind the fact that the stoppage of a hæmor-

* The argument would acquire great additional weight, if it could be asserted with confidence that an action of the ovaries forms a necessary part of the catamenial process.

rhoidal discharge in men, to which, from its long continuance, the constitution has become inured, may likewise give rise to similar symptoms, and has long been recognized as one of the causes of gout.

The remarkable extent to which women are exempt from gout, as compared with men, has been well known from the earliest periods of medical history, and was attributed by Hippocrates to the influence of the catamenial discharge upon her system. Dr. Holland has the following passage in his valuable Essay on Gout*, which I am glad to quote, as evidently favouring the notion under discussion. He says, "That there is some connexion between these (the sexual functions) and the causes and course of gout in the system is an old opinion, and probably a just one. Little can be presumed as to the nature of this relation; but probably it is subordinate to the causes which more directly determine the presence and qualities of a morbid matter in the body. All changes, gradual or sudden, in the great functions of life, must modify, more or less, the production of this; and none, perhaps, more importantly than those taking place in the sexual state."

* *Medical Notes and Reflections*, Second Ed., pp. 133-4.

To put the point in question in a more definite form, I will venture to state the following proposition, that in cases where the uterine secretions are imperfect, in quantity and quality, and are not duly thrown off from the organ, but are liable to become accumulated in it,—a condition which may sometimes occur in early life (*the rheumatic age*), or which may be deferred until the period when the menses are about to cease (*the gouty age*),—a diathesis may be met with among women strongly resembling the rheumatic or the gouty, and deriving its chief origin, although probably not its only one, from the abnormal secretion of the uterus.

Let it not be supposed that I wish to deny that the uterus may participate in the gouty diathesis, as other internal organs do. I think, however, that this organ is less likely to suffer in this secondary manner, than others, such as the stomach or bladder. But it seems improbable that it should suffer from rheumatism, as a consequence of the diathesis, since we have no instance of other abdominal or pelvic organs being so affected. However, as there can be no doubt that both the rheumatic and the gouty diatheses originate in primary mal-assimilation, it would be going too far to deny

that any organ may sympathize with the general constitutional derangement; nor will the admission that the uterus does occasionally suffer in this way, weaken the truth or force of the proposition, that its retained unhealthy secretions may prove a source of the rheumatic or gouty contamination, in addition to the digestive organs. Indeed, it is very probable, that the retention of its secretions in a rheumatic or gouty system, might favour this sympathy; and, on the other hand, their free excretion would exempt the organ from suffering.

On looking into the article *Dysmenorrhœa*, in the *Cyclopædia of Practical Medicine*, I was glad to meet with the following passage from so high an authority as Dr. Locock. He says, "In a few cases there has been a remarkable connexion between this disease (*dysmenorrhœa*) and rheumatism in the same person, and the medicines, such as *guaiacum* and *colchicum*, given to relieve the rheumatic symptoms, have at the same time cured the *dysmenorrhœa*. This was accidentally noticed in a case, some years ago, by Dr. Gooch, with regard to *guaiacum*; and he consequently was induced to try that medicine, where the painful menstruation existed without the rheumatism, and sometimes with success."

I shall now subjoin some remarks with which my friend, Dr. Rigby, has kindly favoured me.

“I have been for several years aware that many common derangements of the uterine organs are frequently connected with a state of the system analogous to what, when it attacks the limbs, is known by the name of rheumatic gout, arthritis, &c. This is more especially the case with certain forms of dysmenorrhœa, inflammation of the os and cervix uteri with albuminous discharge, and the early stage of schirrus uteri.

“The local symptoms of this state are uterine pains with sense of weight, distension and bearing down, and frequently much throbbing both about the uterus and rectum. The mucous membrane of the vagina is relaxed, much swollen and engorged, but without any symptoms of *active* circulation in the part, and frequently communicates a sensation to the patient of the canal being narrowed, or nearly closed. A thick albuminous mucus, either like white of egg, or of the creamy character, is secreted: the uterus seems to partake in the affection, being usually somewhat larger and harder to the feel than in health, the os and cervix swollen and painful, and in aggravated cases lacerat-

ing pains and actual inflammation of the part occur.

“In many cases there is a distinct secretion of air from the lining membrane of the uterus, or vagina, or both ; which the patient herself is aware of, by its escaping when she puts the abdominal muscles into action, moves the thighs, &c. In some cases it even accumulates in the uterus, and distends it, coming away in considerable quantities at a time.

“A similar condition of the rectum almost invariably accompanies this affection, characterized by much hæmorrhoidal congestion ; in many cases an albuminous mucus, similar to that from the vagina, is secreted. Gas is also evolved, which is apparently secreted *in* the rectum itself, and not disengaged from the intestinal contents in the higher portions of the bowels, for flatus is constantly found by the patient at the lower part of the rectum, without any preceding borborygmi or symptom of its having been carried by the peristaltic action along the intestine.

“The urine is usually of high specific gravity, strongly acid, with large proportion of lithic acid and lithate of ammonia, the phosphate of lime is always copious, the other phosphates are more variable ; but a remarkable feature in

the urine of many of these patients is the large excess of urea which is so frequently present. Thus in six cases which are, and have been for some time, under my care, and whose urine I have carefully examined about once a fortnight, out of forty-eight analyses an excess of urea has been shown thirty-one times.

“In many of these cases there have been well marked symptoms of rheumatic or rheumatic-gouty affections of the limbs. The local symptoms of the uterine affection, as above enumerated, have shown the same sudden changes of increase and abatement as we see with rheumatic gout in other parts of the body, and have been relieved by precisely similar treatment. This engorged state of the mucous membrane with albuminous secretion, is not peculiar to the vagina and rectum in a rheumatic-gouty habit, but is known also to exist in the urethra under similar circumstances; I have also seen bubbles of air expelled from the bladder when drawing off the last portions of its contents in a lady of luxurious and intemperate habits. The gorged and moist state of the conjunctiva in gouty gourmands and drunkards, and their loud rattling mucous cough and abundant expectoration, show that the mucous membrane in other parts of the body take on a

similar action in such cases. Certain forms of asthma come under the same head, the sudden engorgement of the mucous membrane of the air-cells and passages, the consequent dyspnœa, the copious expectoration which follows when the attack begins to subside, the acknowledged connexion between asthma and the gouty or rheumatic-gouty diathesis, and its well known relation with renal disease, all tend to confirm this view."

The practical conclusion which would legitimately flow, from the premises stated in this section (if correct), would lead us to lay great stress on the adoption of all means calculated to prevent the retention of the secretions of the uterus, and to promote the healthy action of that organ; and the more so if the patient already show any indication of the rheumatic or gouty diathesis.

SECTION X.

CHRONIC RHEUMATISM OF THE JOINTS—MORBID ANATOMY OF IT
—IS IT CHRONIC INFLAMMATION?—HOW INDUCED—PHENOMENA
IN THE HIP JOINT—MORBUS COXÆ SENILIS —NODOSITY OF
THE JOINTS, AS AFFECTING THE HANDS.

It is a peculiarity of the rheumatic affection of the joints, even when most severe, that it rarely causes immediate destruction of the articular textures: suppuration or ulceration seldom occur; and when they do, it may be fairly conjectured that they proceed from a venous inflammation coming on in the course of the paroxysm. It cannot, however, be affirmed that the joints always escape intact; on the contrary, a chronic state often supervenes upon the rheumatic paroxysm, or displays itself as a symptom of the rheumatic diathesis, which is distressing to the patient, and most difficult of cure, and which, in some cases, runs its course, apparently uninfluenced by any mode of treatment hitherto proposed.

Most commonly we find the immediate effects of the rheumatic diathesis or paroxysm limited to the ligaments of the joints, to the periosteum of the articular ends of the bones, and to the tendons of the muscles inserted into

them; and sometimes the fibrous fasciæ which invest certain joints, participate in the rheumatic affection*. These textures become thickened by some abnormal deposit; they lose more or less of their natural flexibility, and become altered in colour, and opaque. The synovial membranes also appear thickened, probably by a deposit in the subsynovial areolar tissue, which, as being the nidus of the blood-vessels by which those membranes are nourished, is very liable to become the seat of such an effusion.

In some cases, where the rheumatic paroxysm has not broken out, the chronic affection of the joints consists in an effusion of fluid into their synovial cavities, preceded generally by pain in some part of the joint, which becomes aggravated by pressure or motion. When the effusion is not excessive, the pain is often relieved by it; and when it takes place to so great a degree as to cause great distension of the synovial capsule, pain of a kind different from that first felt is induced; no doubt resulting from the stretching of the fibrous membranes.

* I have seen two cases in which the palmar fascia of one hand was contracted, as described by Dupuytren, producing considerable deformity of the hand, apparently an effect of rheumatism. In one of these cases, the plantar fascia, in the foot of the same side, was beginning to take on a similar condition.

This chronic effusion appears to occur more frequently in the knee-joints than in any of the others; and it frequently affects both knees at once.

These changes are seldom the result of a single paroxysm, but generally ensue upon frequent and repeated attacks; or upon the long continuance of the diathesis. In these respects the analogy with gout is obvious. And although we have no evidence of such deposits in rheumatism, as the chalk-stones of gout, there are abundant indications to show that the rheumatic matter cannot be attracted to the joints in any quantity, or with frequency, without impairing to a material extent the nutrition of their textures.

If the periosteum and the synovial membranes are so apt to suffer, it is not to be expected that the articular extremities of the bones, and the cartilages should escape. Indeed the damage done to these structures constitutes the most serious of the consequences of the rheumatic diathesis or of the paroxysm, inasmuch as the joint may become disabled to a very serious extent.

The change as regards the articular cartilage consists in an absorption of it, which takes place in a slow and gradual manner. At the

beginning of the process of absorption the cartilage appears to divide into a number of fibres, vertical to the surface of the bone, and to undergo a change resembling that which long maceration is apt to produce in articular cartilage*; and depressions or grooves may be seen upon it, which gradually enlarge, unite, and leave the bone uncovered.

At length the whole cartilage is removed, and the articular surfaces of the bones laid bare; these, by constant pressure against and friction upon each other, assume a smooth and polished appearance, resembling the shining surface of porcelain, or of well polished ivory. The ivory-like appearance is not visible over the whole articular surfaces, but only at those points where the great stress of pressure occurs. At other places the fine cancelli of the articular extremity of the bone are exposed, the thin layer of cortical substance which covers them in the natural state having been removed.

Whilst the absorption of the cartilage is going on, remarkable changes take place in the bones. They become materially altered in shape, generally enlarged; and this change of form is due, partly to expansion of the osseous

* As formerly described by Dr. Wm. Hunter.

tissue, and partly to an exuberant ossific deposit formed around the articular extremity, which not only produces sometimes considerable deformity, but presents a mechanical obstacle to the movements of the joint in certain directions. These osseous vegetations are thrown out in the most irregular manner around the joint, and present the greatest diversity of shape and size.

The alterations in the synovial membrane are not the least curious of the changes of nutrition which occur in rheumatic joints. The membrane is thickened, and prolonged at various points into fringes, or villous processes; which latter, as they were met with in one case, Mr. Adams has compared to the long conical papillæ to be seen on the tongue, and about the fauces of herbivorous quadrupeds; "however, instead of being white and firm, they were soft and villous, and entirely of a red colour." These processes dipped into, and completely occupied depressions around the neck of the bone. Dr. Colles remarks, that when the ivory formation on the heads of the bones does not take place, there is a deposit of ligamentous substance; this most probably is altered synovial membrane; and the same able observer describes "a great number of ligamentous productions which dip down into small cavities in the head of the

bone, and seem as if they were absorbing the bony particles."

Numerous small bodies are found in many of these rheumatic joints. They are of irregular shape and size, and in structure are cartilaginous; they occur either loose in the cavity of the joint, or attached to the inner surfaces of the ligaments, or to the articular surfaces by little pedicles, which appear to be formed by the synovial membrane. In some cases, the numbers of these bodies is quite extraordinary. In a specimen, in the Anatomical Museum of King's College, London, the patella is surrounded by an enormous crop of them, each being about the size of a split pea; and a considerable number also exist in connexion with the synovial membrane, which passes in front of the femur, along the condyles. The cartilage of incrustation shows evident marks of incipient decay. In another preparation, the synovial membrane surrounding the patella is prolonged into a multitude of the long villous processes, which Mr. Adams likens to the papillæ on the fauces of herbivora; but these are longer than any such papillæ that I have ever seen. In this specimen the cartilage has been absorbed, and eburnation has commenced. The peculiar ivory-like appearance which the articular sur-

faces assume, does not depend upon any special deposit; it is merely the result of the friction and pressure against each other of two surfaces, which have been deprived of their usual soft and elastic coverings. It is impossible to remove any foreign material from the surface of such bones; and if they be compared with the surface of a gouty joint, upon which a true deposit of lithate of soda has taken place, a striking difference will be at once perceived. The ivory-like surface, moreover, is not peculiar to the rheumatic joint, although rarely occurring in others. It may be found wherever there has been chronic wasting of the cartilages, and attrition of the surfaces.

Are the changes, now described, such as may be fairly attributable to a chronic inflammation of the ordinary kind? I apprehend not. And the great distinction from ordinary inflammation consists in this, that in the chronic rheumatic affection, as Dr. Colles has well remarked, "two very opposite processes are to be found going on at the same time, viz.:—absorption of the old bone and its cartilage of incrustation, with deposition of new bony matter;" whilst in the ordinary chronic inflammation there would be a gradual enlargement of the bone. It is worthy of notice, that in

the malignant diseases of joints, and in the strumous affections of them, both connected with constitutional taint, there is the same tendency to the formation of exuberant osseous growths around the joint, while the articular textures within are suffering destruction and decay.

The rheumatic affection of the joints may be most correctly described as an abnormal nutrition, occasioned by the presence of a peculiar matter in the nutrient fluid, affording doubtless certain points of resemblance to chronic inflammation, yet differing from it in a very marked manner. The term, "Chronic Rheumatism of the Joints," seems to me, therefore, less liable to objection than "*Chronic Rheumatic Arthritis*," proposed by Mr. Adams.

This formidable disease does not spare any of the joints; all those, in fact, upon which the rheumatic paroxysm may spend itself, are liable to exhibit, after the lapse of a longer or shorter time, the morbid changes which I have detailed. It has been described and delineated in all the large joints of the extremities, and in those of the hands and feet; in the temporo-maxillary joints; in some of the vertebral articulations. It appears to have attracted attention first in the hip-joint, and the changes in the head of

the femur, and the acetabulum, were depicted by Sandifort, in his *Museum Anatomicum*, in 1793. Many years ago, as a student at the Dublin hospitals, I became familiar with this disease of the hip, by the name *Morbus coxæ senilis*, from frequent opportunities of witnessing it in those institutions, and from the valuable clinical lectures of my distinguished friends, Dr. Colles, Mr. Wilmot, Mr. Cusack, and Mr. Adams; and since then I have had many occasions of seeing it in this country. It has been described by Boyer and Mr. B. Bell; but by none with more fidelity, or from more extensive experience, than by Mr. Adams, who has given admirable descriptions of the disease, as affecting the hip and other joints, and to whom, in an especial manner, the profession in this country is indebted for our present knowledge of it*. Nor must I omit to refer to the excellent account of the disease in the hip, by my friend, Mr. R. Smith, in the sixth volume of the *Dublin Medical Journal*, and to his many valuable communications to the Pathological

* See his articles on the abnormal anatomy of the elbow, hand, and hip, and knee, in the *Cyclopædia of Anatomy and Physiology*. Mr. Adams informs me that he contemplates publishing a separate work on this subject; for which no one can be better qualified by long experience and great pathological knowledge. Dr. Falconer, of Bath, published a paper on the hip disease, in the *Memoirs of the London Medical Society*, vol. vi.

Society. Cruveilhier has also described and delineated this disease in various joints, under the appellation "*Usure des Cartilages.*" It is evidently the same disease of which Haygarth has given the clinical history, by the name of "Nodosity of the Joints."

The disease is apt to show itself in early life, as well as at the most advanced periods. I am not aware of any cases in which it occurred at an earlier age than twenty, and in the instances in which I have known it at this early age, the subjects of the disease were women; doubtless, however, its foundation may be laid at an earlier period of life. From thirty-five onwards, the disease is by no means uncommon, occurring chiefly among the labouring poor, who are more exposed to the causes of rheumatic affections than the higher classes. It is not very frequently met with in our hospitals; for the disease is so chronic, that the patients cannot be kept in long enough to benefit them; but several examples may be seen in every work-house, those receptacles of the poor under all kinds of affliction, and at all ages. As far as my experience enables me to judge, I should say that there is more of the disease in Ireland (where its causes are more rife) than in England. I know nothing of it in Scotland.

In all the cases *where it affects more than one joint*, whose histories I have had the means of investigating, it is clearly traceable to a rheumatic state of constitution. In some it has followed, after the lapse of a longer or shorter time, a severe attack of rheumatic fever, the developement of the articular disease being more or less gradual; in others it has been the consequence of several attacks of rheumatic fever, or of repeated exacerbations of the rheumatic diathesis. These varieties in the mode of access of the disease, may be not improbably ascribed to differences as regards the quantity or the virulence of the rheumatic matter with which the blood may have been contaminated, and it may be that the source of the infecting matter may exert an important influence upon the extent or intensity of the disease.

The symptoms which accompany the diseased joints, are evidently of a rheumatic kind. The pains which the patient experiences are aggravated at night; vicissitudes of temperature and of weather are keenly felt, and the pains are not confined to the joints which are altered in structure, but are felt elsewhere also. The not unfrequent occurrence of the disease in early age, also stamps it as of rheumatic cha-

racter. And all these points are opposed to its being of a gouty nature. Moreover, neither the joints nor the neighbouring textures exhibit any deposit of the lithate of soda. The disease is very common among women, who are rarely subject to gout, and it occurs at an age at which gout is quite unknown. It is prevalent among the labouring poor, among whom gout is not often met with. It is singular that Dr. Haygarth should have considered it more common among the higher classes, an opinion which does not agree with the experience of subsequent observers.

My limits will not allow me to attempt to depict the features which this malady exhibits in each of the joints liable to be affected by it, even were it in my power to add to the minute and accurate descriptions given by Messrs. Adams and Smith.

I shall, therefore, content myself with a brief allusion to the phenomena of the disease in the hip-joint, and in the hands, where some peculiarities exist, worthy of notice in a practical point of view.

When the hip-joint suffers from this disease, both the acetabulum and the head of the femur become much altered in shape, the former being deeper and wider than natural, the latter being

flattened and expanded, and assuming somewhat the shape of a turnip, or being lengthened into the form of a cone. Both surfaces are deprived of cartilage; the fatty body, which in health occupies the non-articular portion of the acetabulum, and the ligamentum teres, disappear; and eburnation is apparent, to a greater or less extent, over both articular surfaces. There is more or less of the exuberant osseous growths around both the acetabulum and the head of the femur: but the most remarkable feature is that the neck of the femur is shortened to a greater or less degree, so that the position of its head with respect to its shaft is sometimes considerably changed. So remarkable is the change in the general shape of the upper extremity of the femur, that a bone thus altered has been not unfrequently mistaken for, and exhibited as an example of united fracture of the neck of the femur.

A patient labouring under this disease of the hip-joint, has the affected limb much shorter than the other, and consequently he exhibits considerable lameness in walking. Sometimes he merely rests the toe on the ground, but not unfrequently he can place the sole quite flat, a circumstance which adds not a little to the awkwardness of his gait. The foot is everted,

as in fracture of the cervix femoris. So peculiar and characteristic is the gait of persons labouring under this disease, that I have frequently detected it in persons walking at a distance in the street, or on the road. As rotation of the thigh is almost impossible, walking is attended with circumduction of the affected limb. There is flattening of the nates of the affected side, and some atrophy of the muscles of the thigh, which probably is owing to a considerable diminution in the range of all the motions of the joint. When the weight of the body is thrown on the affected joint, considerable pain is felt, which quickly subsides when the horizontal posture is assumed. In the morning the patient feels stiffness in the joint; at night, after having used it through the day, he suffers considerable pain, until the horizontal posture brings him relief.

There are many circumstances connected with this affection of the hip, which might lead us to doubt its rheumatic nature. Thus, it is very commonly confined to this joint; it is rare even for that of the opposite side to be attacked simultaneously with it. Mr. Adams says, "This disease, when once fully established in the hip-joint, rarely or never extends to the

other articulations." It appears that, in some of the cases, traces of rheumatism have not been apparent in the previous history; I must confess, however, that I have met with none in which complaint has not been made of pains of rheumatic character in some of the other joints, although further signs of disease of the articular textures were wanting. In enumerating the causes of the disease, Mr. Adams, while he admits that it may be of rheumatic origin, states that he has reason to think that falls upon the great trochanter have given rise to the first symptoms of this disease*. This is by no means improbable; nor is the fact opposed to that view of the disease which assigns it a rheumatic origin, for doubtless the perversion of nutrition, excited by the violence of the fall, would, as often happens in gout, occasion a greater attraction of the rheumatic matter to the injured joint than would otherwise have taken place. I am disposed to think that most of the instances in which this affection occurs, are examples of the rheumatic diathesis, which fixes primarily and chiefly on the hip-joint. It is remarkable that the chronic rheumatism affecting this joint, occurs much more frequently

* See a paper by Mr. Gulliver, in the forty-sixth volume of the *Edinburgh Medical and Surgical Journal*.

in men than in women: indeed, I should say it is very rare in women.

When the hands are affected with chronic rheumatism, great deformity is apt to be produced. All the joints are liable to be involved; but the greatest alterations of form are met with in those of the fingers. Besides the wearing away of the cartilages, the ossific growths, and the ivory-like surfaces, the joints become dislocated, and the fingers are drawn more or less out of their natural position; they are generally drawn forcibly over towards the ulnar side of the hand, overlapping each other, the innermost fingers being in a state of flexion. The extremities of the metacarpal bones are generally much enlarged. "The carpus," says Mr. Adams, "is usually preternaturally convex, on its dorsal aspect, owing to the thickening and distension of the synovial bursæ, which become like solid ganglions."

Both hands are almost always affected, and with remarkable symmetry; and it rarely happens that several other joints are not simultaneously involved. It is remarkable how frequently this affection of the hands occurs in women, and how rarely in men; and there are many facts which indicate that in the former it may have an uterine origin, either connected

with the puerperal state, or from a defective or difficult catamenial action. Dr. Haygarth remarks, that the disease is almost peculiar to women, and generally begins about the period when the menses naturally cease. Out of thirty-three women in whom he observed it, only three had it during the period of regular menstruation. One of these had suffered twelve abortions. In another the nodosities appeared three years before menstruation ceased.

Cruveilhier relates an example of the disease in a woman of fifty years of age, who twenty years before, *in consequence of a severe labour*, had been seized with rheumatic fever, which affected all her joints in succession; the pains diminished, but were not completely dissipated. The patient, without experiencing any fresh attack of rheumatism, felt her knees to become gradually stiff and painful, and all the other principal joints, including those of the hands, soon became involved.

The following case has lately come under my notice.

Anne Cummins, a widow, ætat. fifty-six.—Both hands are much affected with the chronic rheumatism: the dorsal aspects of the carpi very convex; the fingers nodulated and flexed; motion very limited and painful.

Her first confinement took place sixteen years ago. Almost immediately after it she caught cold, and was attacked with severe pain in the loins and left wrist-joint; from this, however, she quickly recovered.

Two years afterwards, while in her catamenial period, the flow being scanty and difficult, she again caught cold, the menses suddenly ceased, and she was immediately attacked with rheumatism in her joints; both knees, ankles, and wrists, and afterwards the elbows, being involved; they were very painful, and greatly swollen. The distortion of her hands and wrists have been coming on gradually ever since.

It is quite erroneous to limit this affection to the period of the decline of the menses, as Haygarth has done. There are many instances of its occurrence in women under thirty. Mr. Adams has communicated to me the particulars of it in a girl of twenty-three, consequent upon rheumatic fever. Many years ago I met with it in a girl of twenty-two; also following rheumatic fever, in the course of which this girl had a severe endocarditis. And Dr. Colles tells me of a similar case, also traceable to the same source. Nothing is known of the catamenial function in these cases.

Among the inmates of the Wandsworth Union, is a poor girl, aged twenty-five, who is the most complete martyr to this disease in all her joints, even in those of the cervical vertebræ. She is so crippled that it has been found necessary to construct machinery in order that she may be lifted easily out of bed to have it made. The elbows are semiflexed, and almost ankylosed; the hands afford an extreme instance of the affection I have been describing; very little motion is enjoyed at the hips; the knees are nearly ankylosed and the legs are bent, not under the thighs, but to the left side; the ankles are nearly immoveable; and the joints of the tarsus and toes are beginning to stiffen, and their bones to be nodulated.

This girl first observed her catamenia at the age of seventeen; they were then very scanty, and attended with much pain; and she was liable to leucorrhœa. About this time she caught cold, and was attacked with rheumatic fever; her knees, ankles, hips, elbows, and wrists, being greatly swollen, and exquisitely painful. After this she had exacerbations of her rheumatic pains, with which was always associated a scanty and difficult excretion of the menses; and at one time a deciduous membrane was discharged. For five years the joints have

been gradually passing into the state of frightful deformity and rigidity which they now exhibit*.

It has been stated at a former page that the hands may become deformed from repeated attacks of gout. This deformity, however, is slight in comparison to that from rheumatism. The distinction between them may be easily made by attention to one or two circumstances. The history of the case will, in general, indicate whether the patient be of gouty, or rheumatic habit; and the age is an important element to be taken into the account. If any deposits of lithate of soda be present, either on the hands or fingers, or elsewhere, the case is clearly one of gout. Sex should be considered, the female being prone to the rheumatic, the male to the gouty affection. The previous existence of rheumatic fever should be sought for, and the symptoms which may be most relied upon, as denoting its occurrence, are the copious sweatings, and disease of the heart.

* The reader cannot fail to perceive that the cases here detailed lend strong support to the opinions advanced in the last section.

SECTION XI.

OF THE TREATMENT OF THE RHEUMATIC DIATHESIS—REGIMEN
FOR RHEUMATIC PATIENTS—LOCAL TREATMENT—APPLICATION
OF IODINE—CLIMATE—TREATMENT OF RHEUMATIC FEVER—
OBJECTIONS TO EXCESSIVE BLEEDING—OTHER PLANS OF TREAT-
MENT—TREATMENT OF CHRONIC RHEUMATISM OF THE JOINTS.

IN the treatment of the rheumatic diathesis, the practitioner has difficulties to contend with, even greater than those which meet him in the management of the gouty patient; for as rheumatic matter is more apt to fix itself upon several parts of the system, and shows less proneness to make its way out by a single channel, than the gouty matter, the whole frame becomes quickly so thoroughly imbued with it, that the most constant attention and perseverance on the part of the patient, the most rigid adherence to rule, and the most careful avoidance of all those articles of food, or of those external influences which can, in any way, favour the generation of the morbid element are absolutely indispensable to secure the desired object. Nor can the cure be effected in a short time; on the contrary, the treatment, which must be regarded as partly of a preventive kind, must be continued for many years; and daily

habits must be regulated by it, for a period of considerable length, perhaps extending throughout the whole of life. It cannot be expected that a state of system which has perhaps been inherited, or which has been the result of a morbid element, slowly and gradually from an early period mingling itself with the elements of nutrition, in the molecular changes of the frame; it is not, I say, to be expected, that such a state can be removed in a short time. Years are required to remove or to diminish the strumous diathesis; the rheumatic constitution cannot be expected to change in a much shorter time. These difficulties too often daunt the courage of the sufferer from rheumatism; he becomes impatient of the restraints imposed upon him by the rational plan of treatment, and distrustful of the conscientious practitioner, who will not deceive him by holding out prospects of a speedy and effective cure. In proportion as a malady is difficult of cure, does the number of remedies and plans of treatment become augmented. There are many allurements for the rheumatic patient to adopt this or that scheme, neglecting the safer precepts of his more conscientious advisers; and hence this class of sufferers are so often found swelling the ranks of the followers of each new system, which has its day and

its victims, and which in turn is abandoned to make room for another, possessing no greater real claims to success.

As the rheumatic constitution is always accompanied with a more or less imperfect assimilation, the state of the digestive function ought first to engage the practitioner's attention. It is highly important to obtain free and regular alvine discharges, with a due admixture of healthy bile; and when these have not previously occurred, they ought to be excited by purgatives or laxatives, and an open state of bowels should be continually maintained, by such means as will not debilitate the patient. In young persons, small doses of calomel and jalap, followed, when admissible, by the sulphate of magnesia in solution, and the carbonate of magnesia, answer extremely well; and, indeed, the same forms of purgative are applicable to older patients. The admixture of alkali serves to neutralize the free lactic acid which tends to show itself in the stomach, and a lax state of bowels is favourable to the removal of noxious matters, of mucus which may accumulate, and in which more or less of the morbid element may lurk.

The greatest attention should be paid to the state of the skin, in this malady. Daily

ablution in tepid water, friction, warmth of the surface, are among the most useful means of preserving the skin in a healthy state. A decidedly rheumatic patient should be clothed from head to foot in flannel, and should be especially careful to avoid vicissitudes of temperature. The use of diluents is wholesome, provided they be not taken so as to unduly distend the stomach, and thereby hinder digestion. The perspiring action of the skin may be promoted by the warm-bath, the vapour-bath, or the hot-air bath, and by exercise*. The last means, with good dry, but not cold air, is very important to the rheumatic patient, as tending to promote healthy nutrition, and giving a more plentiful supply of oxygen, which has, in some way, the effect of increasing the amount of the colouring matter of the blood, an element of that fluid very deficient in the rheumatic state.

Tonic medicines are very useful in this state of constitution, and none do more good than iron and quinine. The former is especially indicated, where the colouring matter of the

* An interesting case is recorded by Dr. Marcet, in the third volume of the *Medico-Chirurgical Transactions*, illustrative of the good effects of free sweating in chronic rheumatism.

blood appears to be deficient, and more particularly when chorea or deficient menstruation is present. They may very frequently be advantageously prescribed in combination with each other. Sea-bathing and the cold shower-bath may likewise be resorted to, along with other tonics. If the periosteum be much affected, the internal use of iodine is indicated; but this medicine should be used cautiously. Medicines of the sudorific kind may also occasionally be used with advantage, such as, guaiacum, Dover's powder, decoction of sarsaparilla.

The diet should be wholesome and nutritious, consisting of animal food with a moderate proportion of vegetables. All substances prone to the acetous fermentation should be avoided. Hence, much vegetable food should not be taken, sugar should be laid aside, or used sparingly, butter ought to be excluded, and milk taken moderately. Acids generally should be avoided. As to beer and wine, the circumstances of each case must determine the propriety of their use; but they cannot be necessary in the rheumatic diathesis excepting in moderate quantities.

If the joints suffer much, they may be best treated by local stimulation, or counter-irri-

tation. A strongly stimulating terebinthinate liniment is often beneficial; but, on the whole, nothing is so useful in chronic rheumatic states of the joints as blisters applied in rapid succession. In some instances where there have been much pain and swelling, the application of a few leeches will almost always do good. I learn from Mr. Busk, who has had great experience in the treatment of those painful articular affections connected with gonorrhœa, (gonorrhœal rheumatism,) that blisters are an invaluable remedy in them, even from the first, and this accords with my own more limited experience. Doubtless in the case of rheumatic joints blisters act in a similar way, by attracting the morbid element from the articular textures. I have lately employed pretty extensively, and with unquestionable benefit, the local application of iodine to the affected joints, for which purpose we may employ either the tincture of iodine, or a stronger compound, which is used at the King's College Hospital, and is called Iodine paint, the formula for which is as follows:—

℞. Iodinii, gr. lxiv.
Potassii Iodidi, gr. xxx.
Alcohol, ℥j. M.

The mode of application is by painting the part freely with a camel-hair pencil. More or

less smarting is produced, and frequently vesication, or an herpetic eruption may come on. The painting may be repeated as often as circumstances may demand. It is extremely useful where any effusion has taken place into synovial membranes or sheaths.

The climate, which is best suited to a rheumatic patient, is a warm and equable one, not prone to changes of temperature, nor liable to be visited by easterly winds; and care should be taken that the fixed residence of persons liable to rheumatic symptoms, should be in a district from which malaria is absent, and where ague has not been known to exist. A tropical climate is not to be recommended, since the relaxed habit, and the proneness to indulgence it induces, are unfavourable to healthy assimilation. In many districts of India, a serious malady, in many respects analogous to rheumatic fever, called *berri berri**, is endemic, and an

* From an analysis of Mr. Malcolmson's account of this disease, in the *British and Foreign Medical Review*, vol. v., I should be led to the opinion that it is caused by the presence of a morbid matter in the blood, and not as the author supposes, by a diseased state of the spinal cord. A disease of that organ, of sufficient extent to affect the many parts which suffer in *berri berri*, and with such intensity, would speedily cause an annihilation of the bodily functions. Besides, there are certain circumstances which point to malaria and mal-assimilation, as combining to the production of this disease. It is confined to particular districts; and the native practi-

obstinate and virulent form of chronic rheumatism is prevalent, affecting both Europeans and natives.

The various thermal springs of this country, and of the Continent, are valuable places of resort for persons of this diathesis, and the use of the waters may not only favour the action of the skin and kidneys, but also invigorate the digestive organs, and improve the tone of the whole system; while their local application in the form of douches, and in other ways, may prove highly beneficial to the joints. Those places which are usually regarded as most suitable for these purposes, are Bath and Buxton in this country; Wiesbaden, in Nassau; Aix-la-Chapelle; Baden-Baden; and Barèges and Bagnère de Bigorre, in the Pyrenees.

The great objects which the practitioner should have in view, ought to be to invigorate the constitution of the patient, to promote healthy assimilation, and to keep in a state of free action the various channels through which the principal excretions are carried off from the system.

Doubtless the same principles of treatment

tioners enjoin their patients to restrict themselves to a diet of wheat, which is brought from the interior. If space permitted, it would not be difficult to show that *berri berri* has, to a striking degree, the characters of a blood-disease.

ought to guide us in the management of rheumatic fever. If we regard it as an accumulation of a morbid matter, which is being thrown off from the system at those points at which the swellings and pain show themselves, then it is plain that we must endeavour to accomplish one or both of the following objects, namely,—to favour its passage through those channels to which it appears to be naturally attracted, or to find some other outlet for it, by which it may be freely eliminated without endangering the healthy organization of any important part. The joints are the parts through which the rheumatic matter is most prone to escape, and as in its passage through the articular textures it may seriously injure them, it is highly desirable to find some other channel through which its elimination may be directed.

Before entering upon the explanation of the course to be pursued in the management of rheumatic fever, let me inquire whether it is possible by any mode of treatment to *cut short* the rheumatic paroxysm, as we can arrest an attack of pneumonia or of pleurisy. Various as are the plans of treatment proposed by different practitioners, it cannot be allowed that any one of them constantly, or even generally, exerts a decided influence upon the duration of the paroxysm.

The natural history of the disease tells us that the paroxysm rarely terminates in less than ten days; and seldom lasts longer than six or eight weeks. The mean duration of the disease may be rated at from twenty-one to twenty-eight days. A mild attack is over in a fortnight; a severe one lasts fully six weeks; an ordinary one, three or four weeks. Now, on comparing the statements of authors, and the duration of the disease under their different plans of treatment, we do not arrive at a conclusion different from that which I have stated. Dr. Haygarth, who relied chiefly on the administration of bark, gives a mean duration of not less than a fortnight; but it is impossible to derive any accurate conclusion from his incomplete, although elaborate tables. From an analysis of the cases related in Chomel's work, I obtain four weeks as the mean duration from the first seizure to the convalescent state. In the average of my own cases in hospital practice, the patient did not become fairly convalescent under four weeks. According to the table in Dr. Macleod's book, of two hundred and six cases, sixty were cured in from one to two weeks; one hundred and thirty in from two to six weeks; sixteen required from seven to sixteen weeks. A careful analysis of

Bouillaud's thirty-six cases, leads me to assign four weeks as nearly their mean duration, although he boasts of cutting short the disease by copious bleedings in six or seven days. M. Bouillaud, however, considers his patients convalescent as soon as some relief be obtained to the acute affection of the joints; and this he says takes place in from four to six days from the commencement of treatment; yet a perusal of his cases will show that in all, the patient was far from being cured of rheumatic fever, after his so-called period of convalescence, and that several had speedy relapses after that time.

Those channels which are obviously the most favourable for the elimination of the rheumatic matter, are the skin, the bowels, and the kidneys; hence the use of sudorifics, purgatives, and diuretics are indicated. Of sudorifics, Dover's powder is among the best, and is sanctioned by the experience of many years; pure opium answers the double end of promoting diaphoresis while it procures rest and relieves pain; or the nitrate of potash may be given either in combination with opium and ipecacuanha, (a nearer approach to the original formula for Dover's powder), or in solution along with minute doses of tartarized

antimony. I am not in the habit of exceeding five or six grains of the nitrate of potass with one-eighth of a grain of the tartar emetic (to which if there be nausea a few drops of tincture of opium may be added,) every four or six hours. The practice of giving very large doses of nitre, tried formerly in this country, and lately revived in France, does not appear to have any decided influence upon the mean duration of the disease. The administration of opium, however, is of great importance: it must be given in large doses, and is borne well by the patient. A good opiate should always be administered at night, and when there is much suffering, two or three doses should be given throughout the day. The irritative character of rheumatic fever is strongly in favour of the use of this medicine.

The purgatives which seem most applicable are those which produce copious watery evacuations. The combination of sulphate and carbonate of magnesia answers very well, the addition of the alkaline earth serving to neutralise some of the free acid which is so abundantly secreted. Colchicum is useful as a purgative, and if employed in large doses exerts a powerful action on the intestinal canal, but the employment of it is not devoid of serious

objections. The tartrate of potass is also a useful purgative.

The best mode of promoting diuresis in this disease is to allow the patient to use simple diluents freely; to these no other limits need be put than those which his own sensations will dictate. Any more direct stimulants to the kidneys would probably excite those organs too much.

The saline effervescing draughts are agreeable and cooling, and have the additional recommendation of serving for the neutralization of the free acid, in its passage through the kidneys.

Do we recommend local treatment in this disease? The objection which has been urged against local applications to the affected joint during a paroxysm of gout, does not apply to rheumatic fever. In the latter disease the morbid element is escaping at many places, in the former at a single joint; if we disturb its attraction to this one joint in gout, it may fly to a new one, or to some internal viscus. These risks are obviously wanting in rheumatic fever, as the disease is more generalized in its effects. And experience teaches us that the greatest relief may be obtained by local bleeding in this malady. When the joints appear

to suffer much, the application of leeches (for the patient can seldom bear cupping) is called for, lest the articular textures should suffer; and the bleeding from a dozen leeches is almost always productive of immediate relief to the pain and swelling. As, however, local bleeding does not prevent a joint from being revisited by the rheumatic irritation, the employment of it in ordinary cases, and as a general practice, is not to be recommended. You may apply leeches to-day to a joint, to-morrow it will be free from pain, and the next day it may be swollen and painful again. If the pain and swelling, both or either, be great, and such as to excite apprehension for the ultimate integrity of the textures, then the application of leeches will be really useful, and should not be deferred.

When the articular affection is disposed to be chronic, and the rheumatic matter appears to linger about a joint, local bleeding may be of essential service. Its timely use, in such instances, may save the patient from a tedious convalescence, if not from a chronic rheumatism. Local bleeding, in the earlier stages of the rheumatic paroxysm, has the additional advantage of contributing to relieve the general fever in a manner not likely to injure the constitution.

Warm fomentations or poultices often give considerable relief, and if agreeable to the patients they may be used with safety. It has been proposed to foment the joints with a solution of an alkaline salt, as of soda or potass. I have seen this practice tried, but did not perceive any superiority of the alkaline fomentation over that of plain water.

I am strongly inclined to believe that counter-irritation by blisters to the affected joints will be found a very useful practice in the severer cases of rheumatic fever; even in the acute stages. It will generally, however, be adviseable to precede the application of blisters by that of leeches. My experience of this practice has not been sufficiently extensive to warrant my speaking confidently concerning it; but I think it deserves a more extensive trial than it has yet received; for it is highly reasonable to suppose that any irritation of the surface, acting on the principle of revulsion, must relieve the deeper seated tissues.

During the whole period of treatment of the rheumatic paroxysm, the practitioner should be most sedulous in watching the action of the heart, the least disturbance of which should be the signal for the adoption of measures to prevent the terrible consequences which inflamma-

tion of it may produce. Any change in the character of the pulse, the occurrence of intermissions in it, a sudden diminution or increase in its frequency or force, an irregularity in its rhythm, ought at once to awaken the suspicions of the physician as regards inflammation, either within, or on the surface of the heart. Above all, he should be most careful in his endeavours to detect the first indications of a change of structure, on the outer or inner surface of the heart, as denoted by the presence of a friction-sound, or a bellows'-sound. The occurrence of any of these signs is, in my judgment, a sufficient warrant to justify his having immediate recourse to local bleeding over the cardiac region. A large number of leeches should be at once applied; or a good quantity of blood should be taken by cupping. I have no doubt that by prompt practice of this kind, inflammation of the heart may be checked at its commencement; and as this is the time when the interference of art may be the most efficacious, it is plain how much the future comfort of the patient depends on the vigilance and sagacity of his medical attendant at this juncture.

My experience leads me to value very lightly the efficacy of general bleeding in inflammation

of the heart. I have never seen an instance in which it unequivocally did good; and the prevalent custom of combining local depletion with venesection, shows that practitioners do not usually place much reliance upon it. Immediately after local bleeding, a large blister should be applied, not exactly over the cardiac region, but a little to the right of it, in order to allow space for the application of more leeches if necessary. The blistered part should be afterwards dressed with mercurial ointment, the cuticle having been previously freely removed, so as to expose a large surface, from which an abundant secretion may be provoked. If there be much irritability, opium should be freely administered; and, if a friction-sound or a bellows'-sound be present to indicate that the products of inflammation have already begun to be formed, then mercury, combined with opium, should be given in doses sufficient to get the system under its influence as quickly as may be done without depressing the patient too much. There is a twofold object in administering mercury under these circumstances; first, to check the effusion of lymph; and secondly, to promote the absorption of that which has been already poured out. When the constitutional

effects of mercury can be quickly induced, these important objects will generally be attained.

Cases now and then occur in which large quantities of mercury are given ere the mouth becomes affected, or in which it seems impossible to produce salivation; are we to infer that in such cases mercury does no good, and that it would have been better omitted? It appears to me that there are two states in which, although inflammation exists, mercury is slow to produce its constitutional effects. The first of these is when the fever is of a highly irritative character, the nervous system being in a state of excitement or "alarm;" this occasionally happens in pericarditis, and may be brought on by the too free use of the lancet. Mercury is almost inadmissible in such cases, for it increases the general irritability; if administered, it should be given sparingly and conjoined with opium in large doses. The second is, when a very extensive inflammation exists; under these circumstances mercury appears to me to act as opium does in certain diseases: in tetanus, for instance, what enormous doses of this drug will be borne with little or no apparent narcotic effect! what large doses of opium may be given in rheumatic

fever itself! such quantities could not at all be borne by the system in health. In pneumonia we give tartar emetic freely, it acts favourably upon the pulmonary disease, without perceptible effect beyond the resolution of the pneumonic inflammation; yet if we gave as much to a person in health, nausea and vomiting would immediately ensue. Tonics likewise may at times be given to an enormous extent without any exciting effect on the system; and so also with stimulants, a man in typhus fever may take with impunity in a short time, as much wine and brandy as would intoxicate him in a state of health. I believe the same principle holds with respect to mercury; and that in some cases it acts wholly on the diseased organ, and produces none of its usual constitutional effects. We are not to infer that in such cases mercury does no good, and is inadmissible: on the contrary, if no untoward effect is produced, we should persevere with the use of it, even after the more acute symptoms have subsided. The rate of action of the mercury may even assist us in forming an opinion as to the extent of the inflammation, a tardy action indicating that it occupies a considerable surface; and it may also aid our prognosis, for the appearance of the affection of the mouth within

a moderate time (two or three days) augurs well, whilst a difficulty in producing ptyalism must be considered inauspicious.

The diet in rheumatic fever ought to be low, the patient being allowed abundance of diluents. But as there is a considerable wear upon the system, I generally allow some beef tea after the second or third day, and I have not had reason to regret doing so.

When the sweats are very profuse, and especially if they be attended with an eruption of erythematous spots on the skin, with a pulse which, although full and bounding, is distinctly compressible, quinine with sulphuric acid, is called for; and in this state I have also given wine, with great advantage. In such cases it is not improbable that the rheumatic matter may be of a more virulent kind, so as to produce some depressing influence upon the nervous system of the patients. The case of Amelia Trevis (related at page 149) was of this kind.

The delirium which ensues in rheumatic fever, may be treated best with opium, and an improved diet.

To judge of the period of commencement of convalescence, some look to the joints, and infer from the relief to them that the fever is declining. A better test may be found in the

tongue and the pulse : the former never becomes clean until the fever is fairly resolved ; the thick white fur continues less or more while the rheumatic matter yet lurks in the system ; the pulse loses its fulness and diminishes in frequency, acquiring more tone as convalescence advances.

When the more acute symptoms have subsided, it is time to give tonics, of which, when there is much anæmia, iron should form a part, with wholesome and nutritious diet.

Such is the mode of treatment which, as appears to me, is applicable to a large proportion of cases of rheumatic fever : the great principle of it is to guide the fever in its course, keeping open those channels through which the rheumatic matter may be eliminated with safety, and having always in view the great importance of guarding the patient's constitution against such a state of depression as may favour the further generation and accumulation of rheumatic matter, and give rise to relapses, or perpetuate the rheumatic diathesis.

I now proceed to notice very briefly certain plans of treatment, which have been strongly advocated by some physicians. These are the treatment by large bleedings, that by colchicum, that by opium, and that by calomel and opium.

The treatment by large bleedings was first introduced into this country by Sydenham; and subsequently it was advocated by Sir John Pringle. And in the present day the practice of taking away more or less blood in the commencement of the attack, is adopted, I fear, too generally. Large bleedings are strongly advocated by Bouillaud, in France; and Dr. Macleod, in this country, appears to rely greatly on them in some cases. They are said to have the advantage of cutting short the disease; so that the period of convalescence begins very early. Bouillaud takes away from three to six pounds of blood in the course of the first three or four days, which amounts to from the tenth to the fifth part of the whole quantity of blood in the body; and along with this he employs local bleeding, as occasion may seem to demand. Bouillaud is a zealous advocate for this practice; and, unhappily, in his narrations of cases, displays a vast deal of special pleading, and a zeal for victory, more than for that which ought always to be the great aim of the physician, the discovery of truth. The reports of his cases by no means warrant the extravagant inferences which he draws from them. Relapse is not unfrequent among them; pericarditis and pleurisy occur often; and convalescence is

tedious and painful. A state of bloodlessness is brought on to such a degree, that the *bruit de diable* was heard in the neck in many cases; and I have already stated, that, reckoning from the first seizure to the time when the patient is discharged from medical supervision, the mean duration of the disease is not less than under modes of treatment less trying to the constitution. Nearly all physicians in this country unite in condemning this most mischievous system.

I shall give examples of some of M. Bouillaud's cases, from which my readers may judge how far his plan of treatment is worthy their imitation.

Observation 76 is the case of a man, thirty-five years of age, who was seized with the symptoms of rheumatic fever on the 7th of August; on the 12th he was admitted; in the course of three or four days he lost six pounds six ounces of blood, and M. Bouillaud pronounced him convalescent *six* days after his admission! On the 21st, (the 14th day of the disease,) he is reported as still sweating, "état sudoral," with a pulse at 80. On the 24th, while yet sweating freely, his pulse is at 124; intermitting and irregular; numerous sudamina on different parts of his body. On the 26th

his pulse was 124, irregular and intermitting. On the 31st of August (the 24th day), he is reported to be better. He remains in hospital during the whole of September, during which period no report is made, and is discharged October 1st (54 days after his first seizure); and M. Bouillaud has the candour to tell us, that *fifteen* days after his discharge, he had a recurrence of the pains in his joints, for which he sought admission into another hospital.

In Observation 80, we find recorded the case of a man, ætat. 20, who was attacked on the 16th of March; admitted the 18th; bled to three pounds fourteen ounces. On the 6th of April (the 21st day of the disease), he is reported free from pain; yet on the 10th he has a relapse, for which he suffers further depletion to the extent of two pounds two ounces.

In Observation 84, we have the case of a girl, ætat. 19, who is characterized as *chloro-anæmique*. She is seized April 9th, admitted the 15th, and bled to four pounds of blood, perhaps nearly one-sixth of the whole amount circulating in her system. On the 27th the pulse was 60, and the *bruit de diable* was audible in the neck. On the 2nd of May (23rd day), she is discharged. On the 3rd of June she

experiences a relapse, and remains in hospital till the 1st of July.

In Observation 85, which is one of M. Bouillaud's *mild* cases, the patient, a man, ætat. 35, is seized on the 12th of May; on the 20th he is admitted; bled to three pounds six ounces, and leeches. On the 28th (16th day), his left knee and foot are painful; pulse, 72; *bruit de diable*. He is discharged on the 20th of June, thirty-nine days from his first seizure.

No comment upon these cases is necessary to show that *real convalescence* is not hastened by M. Bouillaud's plan. Indeed, a return to robust health must be retarded; and there would seem but too much foundation for the fears expressed by Sydenham as to the effects of excessive bleeding; “unde non tantùm ægri vires pro tempore franguntur, sed si paulò fuerit naturâ debilior, aliis etiam morbis ad annos aliquot obnoxior ferè redditur.”

In well marked cases of rheumatic fever, Dr. Macleod goes nearly as far as M. Bouillaud; and proposes, within the first week of their onset, and in individuals of the average degree of robustness, to abstract from twelve to twenty ounces of blood *several successive times*, in the course of five or six days. But he advises, that venesection should not be repeated,

if the blood present a loose coagulum; if the pulse lose its bounding character; if the pains diminish; and if no relief follow one, or at most two bleedings. Yet the results of this practice do not afford us any distinct evidence of its superiority over a less severe method. Dr. Macleod does not enter into sufficient detail in his tables, to enable us to judge of the nature of his thirty-two cases, which were less than a fortnight under treatment. It is probable they were mild cases; and some of them, doubtless, had experienced a previous attack*.

Many practitioners recommend that the treatment of rheumatism should be commenced

* It is not a little remarkable that Dr. Seymour, practising in the same hospital, by a milder method, should obtain an average amount of success not inferior to that of Dr. Macleod. Dr. Seymour premises *one blood-letting* before he has recourse to any other mode of treatment. "It rarely happens, however, from the age of the patient, or the extreme severity of this disease, that venesection is to be had recourse to more than once." "After blood-letting and purging, the remedy relied upon by Dr. Seymour is the *mistura guaiaci* of the Pharmacopœia. The gum is here simply rubbed down with sugar and cinnamon water. In one hundred cases of this disease, in hospital practice alone, this form of guaiacum has been used with unerring success in the severest forms of acute fibrous rheumatism, and under this treatment, patients, unable to stir their limbs from redness and swelling with acute pain, have *in one week* been free from the symptoms of the disease; and in a fortnight, able to leave the hospital." * * * * *

"This remedy does not act as a stimulant, but as an evacuant;

with venesection, under the impression that it tends to diminish the intensity of the febrile paroxysm, and favours the action of other evacnants subsequently employed. In comparing those cases, in my own practice, in which I adopted this measure, with those in which I omitted it, I do not find that the former had any advantage over the latter, although I was careful to select for the comparison only those cases which, in point of intensity of fever, bore the nearest resemblance to each other. On the whole, I would conclude that large and repeated bleedings should be avoided in rheumatic fever, other evacuations, free purging for instance, being as capable of modifying the fever, without the risk of doing ulterior mischief, and opium being more effective in relieving pain; and that blood-letting at all, even at the commencement of the disease, should be the exception, and not the rule. In the expressive language of Dr. Seymour,—“Why should we batter down a town which we can reduce entire? or

provoking purging, perspiration, and a flow of urine, in a very violent manner; sometimes one, sometimes all these effects follow the use of the medicine. Indeed its purgative action is so considerable, that it is often expedient to give a grain of opium at bed-time to moderate the discharge.”—*Johnson's Journal*, vol. xxxiii.

why resort to the great artillery of physic, when milder methods will prevail?"

If it could be proved that bleeding favours the determination to the heart, we should be furnished with an insuperable objection to this practice. But although the opinion is sanctioned by some highly respectable names, it must be admitted that the point has not been established. Still some striking facts may be stated, calculated to excite considerable apprehension lest this practice should increase the tendency to cardiac inflammation*. 1. It is

* I am tempted to quote the opinions of some practical writers in reference to the effects of bleeding.

Dr. Willan says:—"Some practitioners continue to let blood in most cases of acute rheumatism, thinking themselves justified in their mode of practice by the sizzly appearance of the blood. The same principle might lead them to empty the whole sanguiferous system; for every time blood-letting is repeated, the blood becomes more and more dense, or sizzly. I have further observed, that by bleeding repeatedly, the pains, swellings, and febrile symptoms are not only aggravated at the time, but often protracted indefinitely; at least I have seen them continue under such a mode of practice upwards of two months."—*Report on the Diseases of London*, p. 155.

Dr. Alison says,—“The acute rheumatism cannot probably be much shortened in its duration by antiphlogistic remedies, and if it were so shortened in external parts, we have good reason to think, *that the risk of affection of the heart would be greatly increased.*”—*Outlines of Pathology*, &c., p. 362.

Dr. Francis Hawkins, who has given an excellent account of rheumatic fever, remarks,—“Excessive bleeding, which has been another error in the treatment of acute rheumatism, may likewise protract the disorder, as has been remarked by Dr.

not a little remarkable, that the highest rate of frequency in the occurrence of pericarditis is assigned to it by the physician, who is the greatest advocate of the system of venesection, and who carries it further, perhaps, than was ever done by any one else. 2. Bleeding, as is well known, is extremely apt to increase the irritability of the heart, and the more so, as the depletion is more copious, and thereby to bring about a condition most favourable to the developement of inflammation, whether on its surface, or its lining membrane. 3. This irritability is more apt to be excited in cases where the colouring matter of the blood is defective, than in others; and this deficiency of the colouring matter, is one of the most prominent features of the rheumatic state. 4. The violent delirium, so characteristic of excitement without *power*, is sometimes, and not unfrequently, coincident with pericarditis. 5. In the practice of physicians,

Willan, amongst many others; but it is perhaps still more likely to give rise to metastases of inflammation to internal organs."—*On Rheumatism, &c.*, p. 61.

Dr. Watson suggests that youth predisposes to the cardiac affection. This quite coincides with Dr. Macleod's observation, and with my own. The fact ought to make us more cautious of venesection in young subjects. The frequency of the occurrence is probably due to the greater completeness of the diathesis, when it comes on in early age, since it is then often as much inherited as acquired.

who do not use the lancet with such freedom as M. Bouillaud, cardiac inflammation is much less commonly met with. Dr. Hope says that one case in twelve is the maximum in his practice; while M. Bouillaud affirms that its coincidence with the rheumatic attack is the rule, and its non-coincidence the exception. 6. Bleeding does not get rid of the rheumatic diathesis: on the contrary, the frequent occurrence of relapses in M. Bouillaud's practice, denotes that it tends rather to perpetuate it, and I have shown that the cardiac affection may come on in the diathesis, independently of the paroxysm.

I shall now offer a few remarks on the plan of treatment by colchicum. This drug is very commonly used in rheumatism: in this disease, however, it acts far otherwise than in gout. I believe that it is capable of shortening considerably the acute articular affection; but I fear that it has no power to limit the duration of the fever. To accomplish the former object, the patient has to go through an ordeal, often even more trying than the endurance of the pains in the joints. I have not found colchicum beneficial in the way I have mentioned, unless it be given in large doses, frequently repeated; not less than half a dram of the wine of the root, every three hours, and then I do not find that

these results can be obtained, unless considerable irritation of the gastro-intestinal mucous membrane be produced, and free purging and even vomiting take place. The prostration thus occasioned is extreme, and there is no small risk of producing an inflammatory state of the mucous membrane of the stomach and bowels. This practice, therefore, has but little to recommend it.

The next plan of treatment to which I shall allude, is that by large doses of opium; a practice which has been recently commended to the notice of the profession, in an able paper from the pen of Dr. Corrigan of Dublin, to whose excellent remarks I am happy to refer for confirmation of many of the observations contained in this section. Dr. Corrigan, viewing the fever of acute rheumatism as "the fever of irritation, not that of common local inflammation," revived the practice of giving large doses of opium in this disease. "Full and sufficient doses must be exhibited; the quantity being proportioned to the severity of the pains. One grain may be given every two or three hours; and the opium should be increased both in frequency and quantity, until the patient feels decided relief; and should be then kept up at that dose until the disease is steadily declining."

The very favourable report, which Dr. Corrigan gives of this plan of treatment, shows that it deserves an extended trial. No untoward effect has been known to occur from the exhibition of so large a quantity of opium, and the patients exhibited a remarkable tolerance of it. In one case as much as two hundred grains were taken in a fortnight.

I cannot, from my own experience, form an opinion of the exhibition of opium in such large quantities. I can, however, testify strongly to the great value of the narcotic in the painful stages of the rheumatic fever; and I conceive, it is in the early period of that disease when the sufferings of the patient from the pain of the joints are so acute, that opium may be used with greatest advantage. I confess my principal objection to Dr. Corrigan's plan is theoretical; and is founded upon the fear that, as opium contributes but little to increase the various evacuations, (excepting that by the skin) the full elimination of the rheumatic element may not be sufficiently provided for.

Respecting the treatment by calomel and opium, I cannot do better than quote Dr. Macleod's statement, which entirely accords with my own experience. "At one time I was in the habit of always giving calomel with the

opium ; but I repeatedly observed that the rheumatism continued, although the mouth was affected, while it speedily subsided on continuing the narcotic and purgatives without the mercurial." Mercury appears to have no influence over the rheumatic matter ; and it is chiefly useful in limiting the effusion and organization of lymph on the serous surfaces of the heart. Nor are we justified in adding the miseries of salivation to the other distressing accompaniments of the rheumatic fever, unless the prospects of doing good by it be very unequivocal.

I now proceed to consider the treatment of chronic rheumatism.

The chronic pains, which succeed to the rheumatic fever, are frequently very difficult of cure ; and it appears to be very generally allowed, that they are the more obstinate, in proportion to the debility of the patient. The attention of the practitioner should be chiefly directed to restore the patient's strength, and to invigorate his system by wholesome food, tonic medicines, and moderate exercise ; and by promoting the action of the skin, bowels, and kidneys, to such a degree as shall not debilitate. In short, his object should be to obtain a healthy assimilation, and at the same time, to keep up

a moderate action of the emunctories; nor should he lose sight of his patient until health is well restored, and these chronic pains got rid of. The tonics which I have found most useful under these circumstances, are quinine and iron. It is often expedient to employ guaiacum in this stage, or the iodide of potassium. The effects of both these medicines should be carefully watched, that they may not produce a depressing effect. The iodide of potassium is most suitable in cases where the fibrous membranes and the periosteum appear to be more particularly the seat of irritation.

The treatment of the more chronic and obstinate cases of rheumatism is to be conducted on the same principles as those laid down for the rheumatic diathesis. The practitioner must never lose sight of the important object of procuring healthy assimilation and natural secretions.

When the disease has gone so far as to occasion destruction of the articular textures and deformity of the joints, little can be expected from the interference of art, but temporary relief to local pain. Rest, warm bathing, the douche, good air and diet, constitute the chief means within the reach of the practitioner. The regeneration of such a texture as

cartilage, is evidently not to be hoped for; the prevention of further mischief, the better adaptation of the movements of the joints to their altered form, and some modification of the rheumatic diathesis, are as much as can be attained.

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