

# B R A I N .

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## Original Articles.

### A PLEA FOR THE NEUROTIC THEORY OF GOUT.

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"The difficulties and refinements relating to the disease itself . . . I will leave for Time, the guide to truth, to clear up and explain."  
*A Treatise on Gout and Dropsy, Sydenham, 1683.*

I VENTURE in the present essay to put forward some arguments which tend, in my opinion, to sustain the thesis, that gout is a malady of neurotic origin.

In the first place, I wish to clear myself from a charge that may be brought against any one who seeks to promulgate such a view. I must confess that I am not bound to any one-sided theory of disease, in general; that I am not a rampant neuropathologist; and that I am constantly endeavouring to seek exactness and truth in medicine. And, having said this much, I may pass on to state that, having been a pupil and intimate friend, for many years, of the late Professor Laycock, I have not failed to imbibe, and to weigh very carefully, the doctrines laid down by him on many matters of profound interest in practical medicine and pathology. I have carried these views along with me, and have applied them, day by day, to the facts which have come before me in the course of hospital experience. At my hands, therefore, these views have received the roughest and most work-a-day application.

"Gout is primarily and pre-eminently a neurosis." So wrote Laycock to me a year before his death. His great predecessor in the Edinburgh Chair of Practice of Physic, Cullen, taught the same doctrine.

"Gout is manifestly an affection of the nervous system, in which the primary moving powers of the whole system are lodged. The occasional or existing causes are almost all such as act directly upon the nerves or nervous system, and the greater part of the symptoms of the atonic or retrocedent gout are manifestly affections of the same system. This leads us to seek for an explanation of the whole of the disease in the laws of the nervous system, and particularly in the changes which may happen in the balance of its several parts. Of the several pyrexiaë which are diseases of the sanguiferous system, some are with, and others without a considerable affection of the nervous system: pyrexia and neuroses, therefore, are necessarily and unavoidably mixed more or less with one another. Of those which are mixed, gout is a principal instance, in so far as it is an inflammatory disease; like rheumatism, it is placed among the pyrexiaë, but it is among the limits between pyrexia and neuroses, and shows more than any other pyrexia does of an affection of the nervous system."<sup>1</sup>

Cullen states that he adopted his views as to the nervous causes of gout from Stahl.<sup>2</sup>

Within the last few years, large progress has been made in the study of nervous disease, and quite recently, in particular, has light been shed upon various affections of the joints, which can now with certainty be relegated to disorders of the central nervous system.

Few writers have approached this subject since Professor Laycock put forward his views, and these, indeed, were never fully developed by him.

His most minute description is given as follows: "Excessive activity of the nervous system, or of portions of it, becomes a highly predisposing cause of the neuroses, as of

<sup>1</sup> 'First Lines of the Practice of Physic,' vol. ii. part i. chap. xiv. Edited by John Thomson, M.D. Edin., 1827.

<sup>2</sup> 'Theoria Medica Vera,' &c. G. E. Stahl. (Halle, 1737.) "De Doloribus Spasticis Arthritico-Podagricis," § xxxviii. p. 1040.

other general diseases. . . . These excesses, when habitual or long continued, are apt to develop hereditary tendencies. Thus, great mental labour, drunkenness, strain on special nerves, and the like, of parents, are often manifested in children as neuroses. Here the influence of the nerve-centres on the nutrient forces of tissue is shewn, as in hereditary insanity, epilepsy, hysteria, angina pectoris, *and even gouty diseases in general*, which, primarily, are neurose degenerations in the nutrition and transformation of certain tissues.”<sup>1</sup>

The exceptions I have alluded to, I must pause to refer to briefly. The first consists in a paper which was written by Dr. Austin Meldon of Dublin,<sup>2</sup> in which he makes objection to the uric acid theory as explaining fully the cause of gout. He quotes cases to show, as is well-known and recognised, that uric acid and urates may exist in the blood to large extent without giving rise to gout, or being the result of gouty taint or inheritance, and he invokes the nervous portion of Cullen's theory to “complete the chain.” His theory is as follows. He believes that the presence in the blood of uric acid and of soda, in some form, constitutes the predisposing cause of gout. “Nerve-force, when in a healthy condition, preserves these two in a fluid state, separately, in a condition in which they may be eliminated by the skin, kidneys, or bowels. As soon, however, as this nerve-influence is lessened, these two substances unite in the tissues most removed from the brain and centre of circulation. Irritation and inflammation excite the nervous system to increased energy, and the disease, for the time, is arrested.” Dr. Meldon lays stress upon the fact of the attacks occurring mostly at night, when the nerve-force and circulation are feeblest, upon the common implication of the big toe, and notes the marked effect of depression of the nervous power as an important factor in their production. This theory, then, is a compound or humoro-neurotic one.

The second exception I have referred to above is a very notable one. I allude to the views of Dr. Edward Liveing which were published in his masterly exposition of the subject

<sup>1</sup> ‘The Principles and Methods of Medical Observation and Research.’ Edit. 2 (Edin. 1864), p. 338.

<sup>2</sup> ‘Lancet,’ vol. ii. (1872), p. 115.

of megrim. Discussing the alliances, and the various symptomatic forms, of megrim, he observes that—"There is much in the history of gout—its hereditary character, limitation to particular ages and sexes, periodicity, explosive character, sudden translations and remarkable metamorphic relations with nervous disorders—*which seems to stamp the malady as a pure neurosis*;" and even the fit itself, with its sudden nocturnal invasion, the late Dr. Todd was accustomed to compare to one of epilepsy or of asthma. Moreover, although the presence of uric acid in the blood of gouty subjects is no longer inferential and admits of ready demonstration, the dependence of the remaining phenomena of gout upon this associated condition, is, to say the least, far from proved; and it is further certain that uric acid is also present in excess under other pathological conditions which have no connection whatever with gout. On the whole, there is much to be said in support of the view that *gout in its various forms is the manifestation of a disorder which has its primary seat in the nervous system itself*; and there is no more difficulty in conceiving that inflammation and pain may be an effect of deranged innervation in the case of arthritis, than in the analogous case of herpes zoster; or that an excess of uric acid should be generated or retained in the system under a similar influence, than that sugar should in the parallel case of the diabetes which follows a lesion in the floor of the fourth ventricle."<sup>1</sup>

As bearing on this subject, Sir James Paget<sup>2</sup> remarks that "disturbance of the nervous system in some form and part may be regarded as a factor in every case of gout. There are reasons enough for thinking that changes in the nervous centres determine the locality of each gouty process, while changes in the relations of the blood and tissues determine its method and effects; and that thus we may explain the symmetries of disease in gout, sometimes bilateral, sometimes antero-posterior, and thus its metastases. But these changes are a part of the pathology of gout which is not yet clinical."<sup>3</sup>

<sup>1</sup> 'On Megrim, Sick-Headache, and some Allied Disorders.' By Edward Liveing, M.D. Cantab. (Lond. 1873), p. 404.

<sup>2</sup> 'Clinical Lectures and Essays.' Edit. 2 (1879), p. 382.

<sup>3</sup> 'Studies of Some Irregular Manifestations of Gout' (1879), p. 93.

In a paper published last year in the 15th Volume of St. Bartholomew's Hospital Reports,<sup>1</sup> I alluded to these views of Cullen, Laycock, and Liveing, and quoted the teaching of Laycock on this subject, showing how he regarded the perverted chemistry of gout merely as an epiphenomenon of a more profound and overruling neurosis; and I ventured to predict that at no distant period Cullen's assertions would be more completely verified and vindicated. Cullen's views have been vigorously combated by Dr. Garrod in his classical work on gout, but I venture to think that with additional evidence now forthcoming, and by the light of other modern doctrines established since Cullen's day, the teaching of that illustrious man, with certain modifications, may not unfairly be sustained at the present time.

Gout has certainly held its place for a long time in humoral pathology, and although Cullen's views tended to overthrow the theory of any special morbid state of the fluids, it does not appear that any marked attention was paid to the nervous part of his ætiology. More stress was laid by his followers upon that portion of his theory which embraced the tone or atony of the system. Cullen held that loss of tone occurred in the extremities, and that this atonic state was communicated to the whole system, but especially to the stomach. He believed that nature restored the lost tone by setting up an inflammatory affection in the extremities.

He further developed from this more fanciful theories, to explain different varieties of gout, such as atonic, misplaced, and retrocedent. Such views as these are hardly perused with patience in these days, and the promulgator of them is naturally regarded as an effete authority.<sup>2</sup> But it is possible, I believe, to rescue from oblivion, and to develop more fully, Cullen's theory as to gout being first, "a disease of the whole system, depending upon a certain general conformation and

<sup>1</sup> Mr. Spencer Wells has called attention to the highly developed nervous system of the gouty, and to the influence of irregular exercise of it, in inducing paroxysms.—'Practical Observations on Gout,' etc. (1854), p. 21.

<sup>2</sup> "The view of the solidists, represented by Cullen, who considered gout to be an affection of the nervous system, has never been able to hold its ground against the various humoralistic theories." Senator, 'Ziemssen's Cyclopædia,' Art. Gout, p. 101, Eng. Translation.

state of body;"<sup>1</sup> and secondly, that it "is manifestly an affection of the nervous system."

The researches of Dr. Garrod seemed to place the modern pathology of gout upon a fresh and secure humoral basis. His facts respecting the uric-acid-excreting function of the kidneys, and the relations between this acid and the disease, have not been controverted, and they constitute a solid advance in medical science, which must ever remain most honourably associated with his name. Still, Garrod, with a degree of caution becoming his scientific position, allows that his views are "in themselves insufficient to explain all the phenomena of gout." He has endeavoured to meet every difficulty which opposed itself to his own theory, and, it must be allowed, with great power and ingenuity. But he has nowhere availed himself of any view which would admit the interposition of nervous influence, and he does not attempt to combat Cullen's particular theory of the specific involvement of the nervous centres. Sir Charles Scudamore, who criticised Cullen's views, also took no heed of the alleged implication of the nervous system, and adopted a humoral theory, starting from the stomach.<sup>2</sup> In more recent times too, the late Dr. Murchison gave in his full adherence to a humoral theory of gout, and expressed himself thus: "I hold that what is called a 'gouty diathesis' always indicates, and is the result of hepatic derangement, and that many symptoms commonly referred to gout, would be more correctly ascribed to disorder of the liver. . . . Gout itself is merely one of the results of lithæmia."<sup>3</sup> The idea that gout was in any way a manifestation of disturbed nervous relations, seems never to have been contemplated by that very thoughtful and philosophical physician.

In a suggestive communication by Dr. Ord,<sup>4</sup> on the relations of uric acid to gout, he offers the view that the malady is a

<sup>1</sup> *Op. cit.*, par. DXXX.

<sup>2</sup> 'A Treatise on the Nature and Cure of Gout and Gravel,' edit. 4 (1823), pp. 10 and 147. Cullen's "third observation" was, that the stomach was the internal part most frequently and considerably affected by gout, yet he repudiated any humoral pathology in connection with it.

<sup>3</sup> 'Lectures on Diseases of the Liver.' Edit. 2 (1877), p. 568.

<sup>4</sup> 'Medical Times and Gazette,' vol. i. (1874), p. 233.

special form of degeneration or want of tissue-organisation in remote, and lowly vascular parts. He believes that the uratic deposits result from either general or local disintegration, and are not to be regarded as significant of their elimination from the blood: further, that the local processes are not dependent on these deposits, and that the latter are not the result of the inflammation. He takes cognizance of nervous influence so far as to affirm that "all authors, in one way or another, admit the direct influence of the nervous system" (which statement I can hardly agree with), and he believes that local gouty "degenerations and inflammation tend to infect the rest of the system through the blood, *and to set up similar actions elsewhere through reflex nervous action.*"

Dr. Ord's theory is therefore mainly humoral, and he is chiefly concerned to combat Garrod's views.

To discuss more in detail the question of the humoral element in the pathology of gout, is not within the scope of the present essay.

It is, without doubt, the case that, hitherto, no theory has been set forth which appears to embrace all the multiform phenomena of gouty disease. The greatest advance of modern research has been to establish the certainty of some special relation to it, in the greater number of instances, of uric acid, and, so far, there is clear warrant for retaining a measure of humoral pathology in our conception of the malady. There is still much to be done in elucidating the causes of the renal inadequacy which must be taken into the consideration of a comprehensive pathology of gout.

The best approach to the line of argument I purpose to take up, will manifestly be to review the special characters of neuroses in general, and then to examine coincidentally, how far the well-ascertained features of gout conform to such characters.

Before proceeding to this analysis, I would first assert that gout is something beyond the mere resultant effects of aberrant relations of uric acid; that it consists in something more than a perversion of animal chemistry; that it is not, by any means, to be explained as an outcome of gastric or hepatic distemper; and that it is not the appanage only of the middle-

aged or elderly high-liver and intemperate drinker, because, as is well known, it affects also, sometimes in early life, the high-thinker and the laborious bread-winner. Without doubt, while accepting all (and that is much) that it is good for, one is impelled to look beyond what may be termed the chemical pathogeny of gout. The researches into the nature and functions of the nervous system, as carried out during the past quarter of this century, come to our aid at this stage of our inquiry, and, amongst these, we have learned two main and important points respecting the neuroses in general. The first is, that they may be primary or central, and the other is, that they may be secondary or induced. In other words, it may be averred that a neurosis is implanted, or a tendency to it established, and this shall be handed down, hereditarily passed on, and thus, a diathetic tendency be formed; or, owing to some toxæmic condition or blood-degeneration, a secondary or induced neurosis may be established.

I shall endeavour to sustain the neurotic theory of gout upon this basis.

Representing special conditions, or rather special morbid modes of evolution, of nerve-force, neuroses are implanted in the individual as a part of his intimate nature. They belong to the individual, and are characteristic of him in the same degree that are his features and other physiognomical traits. An implanted neurosis is, as it were, the representative of a morbid physiognomy for the cerebro-spinal axis. A neurosis, then, is a peculiar disposition, or tendency, on the part of the nervous system, or some definite tract of it, towards morbid evolution or manifestation of nerve-functions. It does not necessitate the existence of any coarse disease, directly obvious to the eye, but it is a more or less abiding condition, ready to come into action upon suitable provocation.

It is specially characteristic of neuroses that, being thus primarily impressed upon an individual, they tend to be transmitted by heredity. It has been alleged that the female sex is more neurotically disposed than the male; but facts do not support this opinion thus broadly put forth. Certain neuroses appear to prevail with greater frequency in males, and others in females; and not only so, but in the case of those



that are common to both sexes, the manifestation occurs at different epochs of life.

Thus, some outbreaks of neurotic disorders are seen to occur at the several septennial climacteric periods, at the times of dentition, puberty, and often at the grand climacteric. In this manner, an element of distinct periodicity attaches to neuroses in general.

Further, a most marked feature in all neurotic affections is that of paroxysmal tendency. Thus, there is the abiding element, with proclivity to recurring outbreak.

Again, it is certainly known that a law of alternation, or substitution, prevails in neuroses, and thus we meet with certain affections in the parent or ancestors, and with others, equally neurotic, in the collateral relations or descendants. We thus have to deal with distinct types of nervous impression. These abiding conditions are more or less prone to be excited into activity according to various circumstances.

It is not difficult to understand the course pursued by a neurotic taint once laid down or impressed; but it is not so easy to conceive the original implanting of such a morbid functional tendency. The mischief, however, is constantly originating in individuals, and as constantly undergoing further development, modification, or even repression.

Excessive activity of the nervous system, or of any part of it, as Laycock has shown, becomes a highly-disposing cause of the neuroses. Habitual or prolonged excess comes thus to develop hereditary tendency. Thus, *undue mental labour, gluttony, alcoholic intemperance, debauchery, and other indulged evil propensities in the parent, come to be developed into definite neurotic taint and tendency in the offspring*. Particular examples of this are not far to seek, and amongst them comes out the disorder so widely and variously manifested as gout. According to this view, for which I plead, gout appears as a diathetic neurosis, and a link in the long chain of its phenomena, so long missing, is now forthcoming.

I have already stated that there is clear warrant for retaining, as *part of the pathology* of gout, a humoral hypothesis, and it may perhaps be applied and relegated to its proper place, as follows. Granting that gout in any individual is the outcome

of a central neurotic taint, we have the ordinary manifestations of it more or less severe. This we may term primary or central gout. The tendency may be transmitted or modified, or, conceivably, may be allowed to die out.

In another individual, gout may "grow up" where previously there was no neurotic taint or tendency. A patient is commonly said to earn his gout by high-living and over-indulgence of appetites. In this instance a morbid blood-state is induced; excess of uric acid is generated, and hyperinosis supervenes.

But is this all? Is this enough to generate all the phenomena we recognise clinically in gouty disease? I believe not. We are compelled at this point to widen our view, and are driven, perforce, to invoke the operations of the nervous system. Having arrived thus far at nothing beyond a special toxæmia, we must drop humoral pathology, and seek for the effects of the blood-dyscrasia upon the nerve-centres. And we have full warrant for this course in contemplating the analogy of other toxæmic states, together with their effects upon the nervous system. The nutrition of this system is plainly affected by morbid blood-conditions, and, thus, expression is given to such poisoning in the form of convulsion and other nervous symptoms.

I believe, then, it may be conceded that a secondary affection of some nerve-centre occurs as a consequence of the altered blood-state *ab intra*, and that thus the order and particular process of the gouty attack is evolved. This we may term secondary or acquired gout. A diathetic neurosis is thus impressed upon the individual.<sup>1</sup>

It is certainly a matter of much interest to study side by side with gouty processes the several joint-affections, or arthropathies, which have come to be regarded of late as of distinctly spinal or otherwise nervous origin. It seems impossible to separate gouty arthritis from this connection. And if it be conceded that this particular form, which is but one

<sup>1</sup> The frequency and severity of gout in England is explicable on the view of the impressed neurosis. The habits leading to gout,—high-living, intemperance in strong drinks (malt-liquors and wines), along with much mental energy, have certainly prevailed more, and amongst larger classes, in England than in either Scotland or Ireland.

of many others, is truly and directly dependent upon nerve-influence, the greatest part of the difficulty in establishing a neurotic theory of gout is forthwith removed. I suppose no greater obstacle has stood in the way of the acceptance more generally of a nervous theory of this malady, than the impossibility hitherto of connecting arthritic disposition with any form of neurosis. So many of the other, and less obvious, manifestations of gout are plainly dependent on nervous influence, that the whole phenomena now appear to fall more naturally into their places.

It is, however, only right to mention here that thoughtful physicians have long ere now conceived the special action of nerve-influence on joints, and of arthritic affection on nerve-centre.<sup>1</sup> The relation sometimes existing between rheumatic fever and chorea is an example in point, as Dr. Liveing has shown.

Much light has been thrown of late upon spinal arthropathies by the researches of Charcot, Ball, Weir Mitchell, and of Dr. Ord. The latter has recently contended for a more scientific revision of our present views upon the pathology of osteo-arthritis or rheumatic gout.

Without elaborate reasoning, Dr. Noël Gueneau de Mussy, of Paris, expressed, some years ago, his opinion that the latter affection was related to gout, as a sort of cousin, but without in any way holding the view that the disorder was a compound of rheumatism and gout.<sup>2</sup>

Dr. Ord's views are not only eminently ingenious, but they accord remarkably with well-observed clinical facts, not hitherto correlated.

As Sir James Paget has remarked, the changes in the nerve-centres which determine the locality of the gouty process, are a part of the pathology of gout which is not yet clinical. They are, therefore, no more than speculative at present, but we gain much from the prosecution of an inquiry in this direction.

With respect to the particular locality affected in the

<sup>1</sup> Liveing, *op. cit.* p. 247. Weir Mitchell, Charcot, &c.

<sup>2</sup> Mr. Hutchinson believes in a "basic diathesis," for both gout and osteo-arthritis.

arthropathy of locomotor ataxia there is some discrepancy of opinion. Charcot has declared for implication of the anterior cornua of the spinal chord. Dr. Buzzard, however, has not confirmed this opinion, and, guided by the noteworthy frequent association of gastric crises with these joint-affections in this malady, as previously observed by Dr. Ball,<sup>1</sup> has suggested a sclerosing lesion, involving the roots of the vagus in the medulla oblongata, in close relation to some trophic centre that may be localised there, presiding over the osseous and articular systems. And he further indicates the bond that may thus exist between implication of joints and such metastasis as may occur to the heart in rheumatic fever: also the occurrence of hyperpyrexia, which is sometimes present in such cases. We have yet to seek for this hypothetical nutrient centre for joints, but in the meantime we are fairly warranted in widening our view, and in directing attention to the high significance of predicating such a trophic centre.

“Discovery by true analogies is always progressive, . . . one analogy leads on to another investigation and arrangement of phenomena, and another analogy.”<sup>2</sup>

It remains now to be shown, more in detail, how the phenomena of gout conform to the recognised manifestations of the neuroses in general.

It can be shown, I believe, that the plea for the neurotic element in true gout is not difficult to establish.

First, there is to be considered the marked tendency of gout to be hereditarily transmitted. This is notorious. The disorder may pass from either parent, and may be mingled with other taints and tendencies passed on from the progenitors. The outbreak may occur in slight or in graver degrees, and may be deferred, overtly, till even the thirteenth climacteric period. Thus, the first plain attacks of gout may not appear till the patient is sixty or over ninety years of age. In all such cases, however, I am convinced that many minor tokens of the disorder have been overlooked in previous years, all of which are sufficiently obvious to the trained clinical eye.

<sup>1</sup> ‘Med. Times and Gazette,’ vol. ii. (1868); vol. ii. (1869), p. 498.

<sup>2</sup> Laycock, *op. cit.* 190.

As a rule, the manifestations are prone to occur at definite ages in each sex, most commonly in the fourth decade in men, and in the fifth in women. My own experience seems to show that gout is increasingly frequent in men early in the third decade.

Certain peculiarities attending gouty transmission are deserving of study. Mr. Hutchinson has called attention to one of these in a suggestive lecture published four years ago.<sup>1</sup> He expresses his belief that what is transmitted is not the active gouty dyscrasia itself, but rather a susceptibility to the influence of certain exciting causes, together with some peculiarly disordered condition of the assimilating and excretory viscera, which renders them unable to deal with particular articles of food. Now, this special susceptibility to definite exciting factors is neither more nor less than a nervous peculiarity, of which the chief character is its liability to break away in certain morbid directions,—its *instability*, in short. This is, I submit, the gouty neurosis. Mr. Hutchinson further believes that gout is wont to show itself with greater frequency and in more marked form in the younger than in the older members of a gouty family, the diathesis strengthening in the parent with advancing years. I think I can confirm this observation.<sup>2</sup> Resemblance to the gouty parent has been specially recognised in those of the offspring most distinctly affected.<sup>3</sup> In other members of the family the tokens of gout may be present, but less marked. These facts are, of course, in accordance with ordinary laws of hereditary transmission. Dr. Wickham Legg has called attention to the fact that gout, like hæmophilia, pseudo-hypertrophic paralysis of Duchenne, and some other affections, is not unfrequently found to be transmitted by the female line, although especially manifested in males, the mothers themselves being unaffected.

A noteworthy feature in gouty ailments is their sudden supervention. As in epilepsy, not uncommonly, the patient often feels remarkably well, and realises his sense of *bien être*, before the outbreak suddenly takes place. This euphoria, or

<sup>1</sup> 'Medical Times and Gazette,' vol. i. p. 543 (1876).

<sup>2</sup> Cases illustrating this are given by Mr. Spencer Wells, *op. cit.* p. 18.

<sup>3</sup> 'Medical Notes and Reflections on Hereditary Disease.' Sir Henry Holland, Bt., M.D., F.R.S. Edit. 3 (1855), p. 29.

delusive corporeal satisfaction, is itself a nervous derangement. Explosiveness is a distinct feature in several of the neuroses, and attaches to such ailments as angina pectoris, asthma, epilepsy, and various neuralgiæ.

The time of the occurrence of the attack is also strongly marked. The majority of the outbreaks take place in the early morning. This is true both of grave and classical cases, and also of many of the minor forms of gouty trouble. The same thing is met with in asthma, neuralgia, and in epilepsy. The pyrexia proper to acute gout is paroxysmal, with remissions, and the pain of gout is likewise paroxysmal. One is here reminded of the influence of marsh-poison upon the nervous centres.

This paroxysmal, no less than the periodic, element in gout, stamps a nervous character upon the malady, and binds it in alliance with other neuroses.<sup>1</sup>

An important connection of the same kind is seen in the unquestionable commingling of gout with other well-recognised neuroses. Thus, hemicrania is sometimes distinctly a manifestation of gout in both sexes, and may be the form of neurosis impressed upon an individual whose parent was gouty, or may itself alternate with gouty arthritic attacks in the same person.<sup>2</sup>

It is not far to seek for an allied condition of tropical lesion in herpes zoster, itself the outcome of disordered innervation.

The doctrine of metastasis must next be considered in relation to gout. The humoralist seeks to explain this clinical fact upon his theory, but such is manifestly insufficient to account for the phenomena. It must be conceded that some nervous law regulates the occurrence of shifting inflammation. It has been supposed to be due to reflex influence. Some distinct predisposition to take on the morbid action exists in the part selected apparently by caprice. The same class of tissue is apt to suffer. Thus, the gouty or rheumatic process flies from joint to joint, or, as in gouty phlebitis, from vein to

<sup>1</sup> Vide Scudamore, *op. cit.* p. 152.

<sup>2</sup> Stahl, *op. cit.* § xxxvi. Trousseau, '*Clin. Méd.*' *Living*, *op. cit.*, &c. Sir H. Holland, *op. cit.*, '*Relation of Asthma to Gout,*' p. 36.

vein, sometimes symmetrically, but not always. The serous and fibro-serous structures suffer especially, but also mucous surfaces. Laycock has shown how these several tissues are related embryologically, and are thus prone to suffer in common when diathetically impressed.<sup>1</sup>

Localised trophical changes follow locally acting causes of depressed nervous power. Thus, impairment of certain centres may lead to the specific nutritional changes witnessed in metastases, and thus the apparent capriciousness is explained in this process.

Amongst the nervous symptoms of gout must next be considered the occurrence of certain sensory perversions, such as tingling and numbness of the fingers and toes, sensations of heat in the palms, thighs, and soles (paræsthesia), and tickling in the throat. As pointed out by Sir James Paget, "gout affects the sensory much more than the motor elements of the nervous system," and he remarks, too, that the pain of acute gout is seemingly out of all proportion to the amount of inflammatory process in the affected part. So, too, all other disorders, modified by gout, seem to be especially painful, for example cancer, as pointed out also by Paget.

Grinding of the teeth is met with in the gouty. Graves first observed this.<sup>2</sup> Garrod has not met with it. Dr. Donkin has lately recorded cases associated with somnambulism,<sup>3</sup> and I have intimate knowledge of two others in which the same phenomena are manifested—the grinding of teeth and somnambulism in a sister, and the talking in sleep in the brother. The maternal grandfather and the mother are distinctly gouty. Cramps in the muscles of the legs, and priapism, are amongst nocturnal manifestations in the gouty. Of insomnia, due to gout, there is much to say. It was originally noted by Cullen, and it conforms remarkably with other periodic neurosal phenomena.<sup>4</sup>

Gouty neuralgia is largely recognised, and is known to be both severe and prone to recur. It is frequently occipital,

<sup>1</sup> *Op. cit.*, p. 196.

<sup>2</sup> *Clin. Med.*, p. 351 (1864 edit.).

<sup>3</sup> *Brit. Med. Journal*, Feb. 21, 1880, p. 279.

<sup>4</sup> Vide Author's paper, *St. Barth. Hosp. Reports*, *jam cit.*, p. 105.

and is met with in the heel, tongue, breast, and more often in the great sciatic nerve. One proof, amongst others, of the truly gouty nature of these is gained from the fact that they yield most readily to anti-gouty medication, and another lies in the frequency with which they are provoked by conditions which elicit other gouty processes.

Amongst the strongest evidences of gout depending upon nervous influences, are the unquestionable facts bearing upon the induction of its attacks.

The influence of many of the existing causes of gouty paroxysms illustrates well the explosive character of the malady. As Sydenham expresses it, before the onset of an attack, "*totum corpus est podagra.*" The precipitation of the seizure sometimes ensues almost immediately upon the provoking cause. In a large number of instances, the latter is of a nature to *depress nervous power*. Thus, unwonted muscular energy, prolonged exercise, stirring emotions, fright, undue excitement, venereal excess, rage, worry, and vexation, are all exciters of gouty paroxysm. So, too, sudden shock to the body, as from injuries and surgical operations, will evoke gout. Dietetic errors are well recognised as factors; thus, a full meal, and excess, or mixing, of strong liquors, will act in upsetting the equilibrium of a quiescent gouty habit. It will be conceded that many of the causes just enumerated are equally potent to elicit manifestations of other neuroses, such as epilepsy, asthma, hemicrania, and angina pectoris. The provoking agency, however, need not always be primarily exhausting. In proof of this, the outbreaks of gout following hydropathic treatment, internally or externally, may be instanced, and, indeed, the causal element need only be such as shall induce some change in the acquired vital habits.

Thus it is, that the subjects of the neuroses hold much of their comfort in life by following a very equable routine. They are prone to give way under any extraordinary pressure.

These considerations explain, in part, why men are more liable to gout than women. They carry on the world's rough work; are engaged in more exciting occupations, and have commonly the greater burden of anxiety to bear.

The more sedentary the occupation, the more profound



the mind-working, and the more intense the strain of life, the greater the tendency to nervous depression, and to the peculiar form of its expression in gout. If to such habits be added high-living, as often occurs in the cases of eminent statesmen, lawyers, and speculators, no link is wanting in the chain of causation, and all the elements for gout are present.

Climatic influence is important amongst these agencies. The dull and "shifty" weather, and the cold east winds of northern latitudes are certainly bad for gout. The nervous depression ensuing upon months of sunless skies—negation of light powerfully lowering nervous tone—is too little regarded as an element of devitalisation in England. The cutaneous eliminant power is checked, and so, aberrant chemical relations are apt to be determined in any parts specially prone to gouty invasion.

The same mal-determination ensues upon the suppression of various discharges, whether from the uterus, from hæmorrhoids, or other sources.

The mental condition of the goutily-disposed is a subject worthy of attention in relation to the pathology of the ailment.

Hypochondriasis has long been associated with gouty taint. It commonly precedes an outbreak, and disappears subsequently. A tendency to sighing has also been observed, and is a plain indication of nervous exhaustion. Hysteria has also been observed to precede gouty attacks in women, and to disappear with the onset of articular symptoms.<sup>1</sup>

Irritability of temper is a proverbial condition in the gouty, and furious outbursts of this kind appear to be, at times, a metamorphic substitution for a more overt and regular attack. It is important to know that many of the minor, but none the less well-marked, phases of gouty paroxysm are in no degree arthropathic. Much error in diagnosis has arisen from taking no heed of any but articular symptoms when searching for gouty tokens in a given case. These less classical attacks very commonly precede the onset of typical ones at a later period in life.

The necessity for prompt recognition of these less well-

<sup>1</sup> 'On the relations between Gout and Hysteria,' *vide* 'Treatise on the Nervous Diseases of Women' (p. 163). By T. Laycock. 1840.

expressed symptoms is obvious, if good treatment is to be applied.

Epilepsy has been known to disappear on the supervention of gout.

Sensations of giddiness and dimness of vision, not uncommon in the gouty, are noteworthy in relation to nervous symptomatology.<sup>1</sup> So, too, the disturbances of the cardiac rhythm, and the co-existent (neurotic) vascular throbbings which are sometimes met with. The cardiac irregularity has been noted to cease with the induction of a regular attack. Dysphagia was noted in connection with gout by no less careful an observer than the late Dr. Brinton.

A consideration of the effects of lead-impregnation in relation to gout, and of the certain liability of the gouty to be more readily than others influenced by lead, leads to the belief that the nervous system is specially implicated in these relations. The fact is, that the blood is imperfectly freed from uric acid in cases of lead-poisoning, and that gout is thus quickly evoked. Dr. Garrod has fully established these facts, and all physicians now recognise them. The lead-influence, clearly through nervous agency, induces the measure of renal inadequacy which is, probably with correctness, acknowledged as a factor in gout. And the knowledge that this metal is capable of setting up special paralysis, epilepsy, coma, and other cerebral phenomena, is of the largest interest in relation to this subject.

I now approach a point in connection with the whole pathology of gout which merits much consideration. The connection of diabetes with gout has been recognised for some years.

I object to the term diabetes as applied to the special form of glycosuria associated with gout. The disorder is met with in certain members of gouty families, some having regular gout, and others manifesting less regular gout, or this alternating with glycosuria. I believe that many cases of temporary glycosuria are due to gouty conditions. The fleeting presence of glucose in the urine of many elderly persons may be thus explained. It has long been recognised that such an affection, which, in many instances, is undeserving of the name

<sup>1</sup> Trousscau, Murchison, Paget, op. cit., H. Mayo, F.R.S., 'Philosophy of Living,' p. 24 (1837).

*diabetes mellitus*, for the simple reason that there is no *diabetes* in the strict sense of the term, is not really a grave one. *The presence of glucose is found to alternate with that of uric acid.* In the aged but little importance should be attached to the symptom. Charcot testified to this, some years ago, in his excellent lectures on the maladies of old people, his experience being gathered at that fertile school of study—the Salpêtrière. In persons under forty years of age, however, glycosuria, even of gouty origin, is a most grave matter, and merits the closest attention, since it may eventuate in confirmed diabetes. It is the rule to find that the quantity of urine passed is not much, if at all, above the normal, but the specific gravity may range from 1.035 to 1.050. An anti-gouty treatment is called for, for the glucose may otherwise only give place to uric acid or increased azoturia, and the gouty habit has rather to be attacked than the glycosuria.

Dr. Lauder Brunton has called attention to this class of cases.<sup>1</sup>

The alliances of gout and diabetes are sufficiently intimate. In both the doctrine of heredity applies, and the nervous system is involved. The same habits lead to each, the same classes of person are affected, and the same exciting causes are potent to evoke both. A consideration of these facts naturally leads to the belief that the portions of the nervous system involved in each cannot be far apart from one another. The medulla oblongata, the sympathetic and splanchnic nerves have been found chiefly affected, and the spinal chord likewise in some instances. The point for the diabetic puncture in the medulla is believed by physiologists to correspond to the vaso-motor centre in the same structure.

Guided by these facts, and by the knowledge that the glyco-genic function of the liver is under nervous influence, by the advancing theories which refer special arthropathies likewise to the same influence, and bearing in mind Dr. Buzzard's views, previously stated, in connection with the gastric crises so commonly associated with the arthritis of loco-motor ataxia, I come to the conclusion that the portion of the nervous system which is specially predisposed to the irregular mode of action known as gout, has its seat or centre in the medulla oblongata.

<sup>1</sup> Art. "Diabetes Mellitus," Reynolds' 'Syst. of Med.,' vol. v. p. 381 (1879).

A point of difference between the arthritic affections which are now referred to nervous influence, and those manifested in gout, is found in the fact, that the latter appears to have an elective affinity, often unilateral at first, for the smaller joints, especially that of the big toe, while most of the others influence the larger ones. Herein, perhaps, lies part of the specificity of gout.

The trophical results of the latter are seen impressed upon the physiognomy, and upon certain tissues, in a manner extremely definite and characteristic.

Thus, are found the large head, the thick hair, with tendency to early greyness, the large, full veins, the long uvula, the soft, smooth skin, the thickened extremity of the nose, and the lineated, brittle nails.

Lastly, I may add an argument in favour of the theory, adduced in this essay, from the therapeutical side.

The universally acknowledged specific action of colchicum in gout is known, owing to Garrod's researches, to be due to no power which it possesses of causing elimination of uric acid. Gouty inflammation is therefore influenced by it without reference to the secondary aberrant relations of uric acid. The active principle, or alkaloid, of the drug colchicia, is a member of a nitrogenised group of bodies to which veratria, strychnia, quinia, and morphia, have close chemical alliance.<sup>1</sup> They all powerfully affect *the nervous system*. Colchicum acts very promptly, and affords often decided relief to the intolerable pain of the gouty process. When taken in health, in small doses, Dr. Meldon and others have found that it induces a general glow at the surface of the body, diaphoresis, throbbing of the blood-vessels and palpitation. Subsequently, there is reduction in the force and frequency of the pulse. Dr. Meldon observed in his own case an invigoration of his mental energies. In larger doses, the effects are most marked along the whole tract supplied by the vagus, and thus, cardio-vascular, gastric and enteric symptoms ensue.

The peculiar benefit derived from this drug is not secured in any other form of inflammation, and thus it is plainly

<sup>1</sup> Vide 'Lectures on Pathology and Therapeutics.' (London, 1867; p. 137.) H. Bence Jones, M.D., F.R.S.

specific. Its cherished action is doubtless exerted upon the vaso-motor nerves.

The manifestly good influence of all agencies which cheerfully inspire the mental condition in the goutily-disposed, must not be omitted from consideration amongst the *juvantia* both of prevention and cure.

The points in this thesis which I have endeavoured to sustain, I now place categorically under the following heads.

*First.*—I contend that the diseased conditions which are recognised as of unequivocal gouty nature, are primarily dependent upon a functional disorder of a definite tract of the nervous system, and that, thus, gout is a primary neurosis.

*Secondly.*—That there is much in the nature of the malady itself, and much evidence forthcoming by way of analogy, to warrant the conjecture that the portion of the nervous system specially involved is situate in some part of the medulla oblongata, where, possibly, may be placed a trophic centre for the joints.

*Thirdly.*—That the gouty neurosis may, like others, be acquired, intensified, and transmitted, also, that it may be modified variously, and commingled with other neuroses; that it may suffer metamorphic transformations, or be altogether repressed.

*Fourthly.*—That this diathetic neurosis imposes its type upon the affected individual in definite nutritional modes, affecting the assimilating and excreting powers, exhibiting marked peculiarities in nervous impressibility, and determining, in more or less degree, a physiognomy of the gouty.

*Fifthly.*—That a large part of the phenomena known as gouty, are due to perverted relations of uric acid and sodium salts in the economy, resulting from the morbid peculiarities mentioned under the last head. Thus, there is excess of urate of soda in the blood before, and during, gouty explosive manifestation, and there is determination (by nervous influence, in all probability) either of this salt to the affected part (Garrod),<sup>1</sup> or there is a too free formation of it at these inflammatory

<sup>1</sup> *Op. cit.*

points, whence it deposited locally, and also set free into the circulation (Ord).

The renal excretory power for uric acid appears to be temporarily inhibited as part of the process of gouty paroxysm. This measure of renal inadequacy would appear to prevail in varying degree as a part of the specific neurosal disorder. In chronic gout, when structural disease has occurred, either tubal, with deposition of urate of soda, or interstitial, with shrinking of the organs, the renal inadequacy may admit of more mechanical explanation.

*Sixthly.*—That in Primary, or inherited, Gout, the toxæmia is dependent on the gouty neurosis; is the outcome, in whatever degree, of it, and is therefore a secondary manifestation.

*Seventhly.*—That, in what I term Secondary, or acquired, Gout, the toxæmia is directly induced by such habits as overload the digestive and excretory organs, and constantly prevent complete secondary disposal of nutritional elements of food; that if, together with such toxæmia, distinctly depressing and exhausting agencies, affecting the nervous system, come into operation, the special neurotic manifestations of the gouty diathesis will occur, and be impressed more or less deeply upon the individual and his offspring.

*Eighthly.*—That this theory of gout, better than any other, correlates all the known factors concerned in the production of the varied symptoms of the malady; and while it displaces its humoral pathology from the preeminence it has so long occupied, it takes full cognizance of it, and seeks to place it in a clearer relation to the phenomena of the disease.

*Ninthly.*—That if it be desirable to refer various maladies to their distinct place in pathology, without reference merely to their chemistry, histology, or neurology, the affection known as gout may perhaps most correctly be relegated, along with some others, to a class of diseases which may be termed neuro-humoral.

*Tenthly.*—An argument is adduced from the *juvantia* afforded by colchicum, in favour of the theory which has been set forth.