

Two of quantities covered p. 107
Report of number, available 89, 60, 14
History of Gout, p. 1/2 p. 73
Causes of Gout, p. 1/2 p. 83

On Gout,

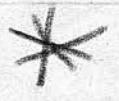
and the
Gouty Diathesis

A Thesis Presented to the
Medical Faculty

of the
University of Edinburgh

by
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a Candidate
for the Degree of
Doctor of Medicine
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History of Gout.

Gout is a disease which has been known from the most remote antiquity, and has numbered among its victims some of the most celebrated men of all ages. It is entirely unknown even in the present day, according to the reports of the most eminent travellers, among nations who live chiefly on the produce of the chase, obtained by the sweat of their brow. In our own, and in all other civilized countries, it is extremely common, both in its typical and well marked forms, and in its lurking and undeveloped condition, embittering the lives of some of the most eminent men of our own, as well as of other professions.

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The first mention of this disease which I have been able to find is in the Old Testament (II Chronicles XVI. 12) where it says: - And Acaz in the thirty and ninth year of his reign was diseased in his feet, until the disease was exceeding great. This was about the year 940. B.C.

Some of our best commentators on the bible tell us that this disease was gout.

The disease was also well known to the ancient Greeks, who gave different names to it, according to the situation in which it occurred. Thus, in perusing their writings, we not unfrequently meet with such names as Podagra, from πους, πodos, a foot, and ἄγρᾱ a seizure, applied to the disease when the foot is affected, Cheiragra, from χερῖ the hand, Gonagra, from γονυ the knee, Omagra from ὤμος the shoulder, and so on, the prefix always indicating the part affected.

The word Gout appears to have been introduced into Medicine about the end of the 13th century by Radulfe, and it is probable that it owes its origin to the theory which has been prevalent in all ages, that the disease was due to some morbid poison, which distilled into the joints drop by drop, and in different modern languages

languages, terms expressing the same notion are employed. In France the disease is called "Goutte"; in Germany, "Gicht"; in Spain, "Gota"; in Italy, "Gotta". The term Arthritis has sometimes been used to indicate gout, and even Cullen was in the first instance inclined to adopt it, but as arthritis would imply inflammation of all, or any of the joints, he afterwards adopted the ancient name of Podagra.

Hippocrates, who lived 350 years before the Christian Era, shows by his aphorisms, that the disease was very familiar to him. He remarks that gouty affections occur in dry weather, chiefly in spring and autumn, (Aph: Hipp: Sect: III. 16. 20); that old men are peculiarly liable to it (III. 31); that lunatics do not suffer from it (VI. 28); that women do not have gout until the menses have stopped, (VI. 29); and that young men are free from it before venery is indulged in, (VI. 30); his treatment consisted in the administration of purgatives, and in the application of cold in the affected parts, for, he says, moderate torpor has the power of alleviating pain. Celsus, who lived about the beginning of the Christian Era.

era, spoke of the beneficial effects of bleeding in some cases, freeing the patient from the disease sometimes for a year, sometimes even for life. He recommends warm or cold applications locally according to the presence or absence of inflammatory action, and specially recommends a regulated manner of living, avoidance of copulence, and frequent exercise.

Galen, who lived in the latter half of the 2nd century thought that gout was caused by an unnatural accumulation of matters in the part affected, the collection consisting of phlegm, bile, blood, or a mixture of these fluids, which, becoming concrete, formed tophi, or gallstones. About this time, both eunuchs and women seem to have been liable to this disease, for we find Seneca remarking "that the nature of women is not altered, but their manner of living; for while they come up to the men in every kind of licentiousness, they equal them in their very bodily disorders. They have, by their vices, thrown away the natural advantage of their own sex, and by putting off the woman, are doomed to suffer all the diseases peculiar to the male."

Arcturus

Aretaeus, a contemporary of Galen, describes very accurately the invasion of this disease: - "Pain" he says, "seizes the great toe, then the forepart of the heel on which we lean, next it comes into the hollow of the foot, but the ankle swells last; and they blame a wrong cause; some the friction of a new shoe; others again a long walk; another, again, a stroke, or being trod upon, but no one will of his own accord tell the true cause; and the true one appears incredible to the patient when they hear of it." He gives a very excellent description of the formation of tophaceous deposits. "Callosities, also form in the joints: at first they resemble abscesses, but afterwards they get more condensed, and the humour being condensed is difficult to dissolve; at last they are converted into hard white Tophi, and over the whole there are small tumours like vari, and larger, but the humour is thick, white, and like hailstones." (Works of Aretaeus. Syd. Soc. edit. and transl. by F. Adams. L. L. D.)

Paulus Aegineta, who lived about A. D. 600, considered gouty and arthritic complaints, as being of the same nature, and differing only in the part they attacked, and depending on a humour which "fixes in some of the joints that are already in a weak state, and

sketching

stretching the nervous ligaments, produces pain
When, therefore, the humour is seated in the joints of the feet only, the complaint is called Podagra; but when the cause is diffused over all the joints of the body, and all the joints are affected, we commonly call it arthritis.
“The humour is different in different cases, as sometimes bilious, sometimes sanguineous, and sometimes melancholic, but for the most part pituitous and crude, being produced by excess of food, indigestion, and want of exercise.”

Haly Abbas, and other Arabian Physicians, looked upon the disease as being occasioned by collections of superfluities in some joint which is labouring under debility, and these superfluities are caused by repletion and indigestion. In treating such affections, they relied chiefly upon purgatives, and some of them, as Avicenna, and Rhazes, spoke in high terms in favour of Hermodactylus. As to local application, some, as Serapion, recommend cold affusion; others again, as Avicenna and Rhazes, speak of burning the joint; whilst others recommend anodyne applications.

14

Definition of Gout.

Sauvages placed arthritis as Gout, in Clap VII Dolores
O. I. Vagi, and defined it as follows: - "articulorum
dolor spontaneus periodicus." Linnaeus spoke of
the disease under the same name, put it into
Clap IV. Dolorosi, O. II. Extrinsici, and defined
it as "geniculorum dolor periodicus, & synovia
corrupta." Sagar also spoke of it under the same
name, placed it into his Clap IV. Ord: I. Dolores
vagi, and defined it as "articulorum dolor
spontaneus periodicus a synoviâ corruptâ."
Vogel spoke of it under the old Greek name
of Podagra, placed it his Order of "Dolores"
and defined it as "dolor rheumatico-artitricus
in pede acutus." Cullen spoke of it
under the same name as Vogel, but gave a
much more elaborate and comprehensive
definition of it, of which he was very proud.
It is as follows: - "Morbis hereditarius oriens
sine causâ externâ evidente, sed præsertim plerumque
ventriculi affectione insolitâ; pyrexia;
dolor ad articulum et plerumque pedis pollicis, cetera
pedum et manusum juncturis, potissimum infestus;
per intervalla revertens, et sæpe cum ventriculi
et internarum partium alternans." This
definition

definition caused a great deal of discussion; every article of it has been disputed, and although it is correct enough as far as it goes, yet it does not take into consideration the important changes in the composition of the circulating fluid, which we will subsequently see has such an intimate relation with gout. Dr. Aitken has given, in his recently published work "on the Science & Practice of Medicine", which, although perhaps too lengthy, gives one a good notion of what gout is. He defines it as follows:— "Febrile excitement, attended with a specific form of inflammation, favoured by congenital or hereditary constitution, associated with disorder of the digestive or other internal organs, characterised especially, by an affection of the joints, and especially, of the great joint of the great toe — by nocturnal exacerbations and morning remissions — by vascular plethora, and the presence of lithic acid and probably of phosphoric acid in the blood. The disease tends to repeat itself, at longer or shorter intervals, when various joints, textures, or parts of the body are apt to become affected."

Varieties of Gout. Cullen describes four distinct

distinct varieties. - (1) Regular, when the affection is confined to the joints alone. (2) Atonic - with atony of the stomach, or other internal part, either with or without the expected inflammation of the joints, - or slight transient pains alternating with dyspepsia. (3) Retrocedent, when the inflammation of the joint suddenly receding, is quickly followed by atony of the stomach or some other internal organ. (4) Misplaced, with inflammation of some internal part, inflammation of the joints, either not having preceded, or having preceded and quickly disappeared. Dr. Mason Good has three varieties of Gout; - Podagra regularis, a regular fit of the gout; P. Latrante, disguised, lurking, atonic gout; P. Complicata, retrograde, recedent, misplaced Gout. Sir Charles Scudamore divided Gout into acute, Chronic, and retrocedent. Prof. Laycock in his Nosology of Fevers, places gout amongst Diathetic fevers, and speaks of three varieties of arthritic fever. (I) Paroxysmal or acute Gout. - Formation or deposit of urates in synovial membranes and derma, with neuralgic inflammation. (II) Rheumatic Gout. - Formation or deposit of urates, with analogous transfor-

- mations

inflammations of articular ligaments" and (III) of gouty inflammation of the serous, sero-fibrous, and elastic ligaments of viscera, such as pneumonia pleurisy &c. In the same author's Proseology of Constitutional diseases, under the head of Arthritic diseases, he speaks of (1) Acute Gout. - a pyretic disease with production of uric acid in the synovial membranes and skin. (2) Chronic gout. - A cachexia with formation of concretions of uric acid and urinary salts, and with deathly degeneration of the ligaments involved. (3) Uraluria? A cachexia with deathly production of uric acid in place of uric acid. A Neurosis?"

In the present paper it is my intention to describe the first and third varieties noticed by Prof. Laycock, that is, the phenomena of an acute, or paroxysmal attack of this disease, the characters of gouty inflammation, attacking internal parts, and to describe also chronic gout, or the symptoms which gout produces in the body after it has existed and continued to recur for any length of time.

The phenomena of a Paroxysm of acute gout may be considered under three heads, or stages, each stage being marked by certain peculiar symptoms. The first stage is characterized by certain premonitory symptoms; the second stage is characterized by pain and inflammation; and the third stage is marked by the decline of the inflammatory symptoms, the occurrence of oedema, of desquamation &c. This division is however only arbitrary, but is convenient for purposes of description.

(I) Of the Premonitory symptoms. These vary very much in different individuals, and sometimes are so slight as scarcely to attract notice. Sydenham thus describes them:— "The fit comes on suddenly and most commonly without giving any notice, only the patient has been troubled indigestion and crudities of the stomach some weeks before. Moreover the body has been oppressed and puffed up with wind, which daily increases until the fit thunders upon him; but a few days before it comes, the thighs are as it were benumbed, and there is as it were a descent of wind through the flesh of them, with convulsive motions, and the day before

before the fit, the appetite is sharp, but not natural." In persons who are liable to disorder or weakness of any organ, symptoms referable to such organ are present; thus, some are troubled with palpitation, and an intermittent pulse; others are troubled with hemorrhoids, and irritability of the bladder, and in some there is a purulent discharge from the urethra; others again are subject to cramps and itching of the skin, and who can wonder, if under such ailments, their temper should be ruffled and irritable. If subject to bronchitis, or any other chronic affection of the chest, an increase of cough and dyspnea may precede the fit. I lately heard from a gentleman, who had just recovered from a paroxysm of gout, and the only premonitory symptom of the fit was *prurigo ani*.

II stage. The unsuspecting victim, who has been suffering from one or other of the preceding symptoms, although they may have been so slight as not to attract his attention, goes to bed as usual, and generally falls into a sound sleep, from which he is awakened, generally about two hours after midnight, by

by a pain in one or other of his feet, mostly
 in the first joint or ball of the great toe, often
 accompanied by slight shivering, which gradually
 ceases as the pain gets worse, and is succeeded
 by heat. The pain grows more and more violent
 and intolerable. It is spoken of as a grinding,
 crushing, wrenching pain; or a burning sensation
 as if a hot iron were pressed into the joint. It is
 attended with great restlessness, and misery, and
 is so exquisitely tender, that the patient cannot
 bear the weight of the bedclothes upon it, or
 even the jar of a heavy footfall in his
 chamber. He is perpetually shifting his foot
 from place to place, and from posture to
 posture, in the vain search after relief. At
 length, about the ensuing midnight, the pain ceases,
 sometimes gradually, sometimes so suddenly, that
 the patient attributes the relief to his having at last
 found an easy position, and now being in a
 gentle perspiration, or as Sydenham calls it, a 'breath-
 ing sweat,' he falls asleep. When he awakes the
 next morning, he finds the part, which had been
 so painful, to be red, swelled, tense and shin-
 ing, surrounded by more or less oedema, and by
 turgid veins. The same series of symptoms re-

occur, in a mitigated degree, for some days and nights; and then the disease often gets entirely off, not to return till after a long interval. As the edema subsides, and the redness fades, desquamation of the cuticle takes place, often attended with troublesome itching. At the time of the greatest febrile disturbance, the urine is generally scanty and high coloured, its acidity is generally increased, often giving rise to a dark reddish brown sediment on cooling. Its precise nature is more particularly referred to, in a subsequent part of this paper. During the severity of the pain, the appetite is generally impaired, but after this has subsided, it may be as good as in health, nay, it is in some cases even augmented. Thirst is usually present when the inflammation is violent. The bowels are for the most part constipated, and the stool pale, or of a dark green colour, and very offensive smell. Patients frequently complain of severe cramps in the legs. When the fit is over, the patient is left in very perfect health; enjoying greater ease and alacrity in the functions of both body and mind than he has for a long time before experienced.

(after Sendamore)
first attempts of
w. Costr.

Table showing part most frequently affected

Part affected	Nb. of cases in wh. ^{not in} part of one of proximity.	No. of cases in wh. both wife	Part of lower limbs with some other part.	Total
Great toe.	314	27	32	373
Ankle	36	11	19	66
Instep	25	6	7	38
Outer side of foot.	10	1	2	13
Knee.	11	1	4	16
	395	46	64	506

The above description has reference to acute sthenic gout, as it occurs in robust and otherwise healthy individuals. When acute gout is of the asthenic type, the symptoms are somewhat different; there may be much pain and tenderness, and some amount of swelling in the part affected, but there is little heat or redness, and all febrile disturbance may be absent. There is generally some amount of edema observed; and both desquamation and itching usually follow in the same order as in the acute disorder. This form of gout is doubtless of the same nature in its essence and pathology as acute sthenic gout, the difference depending upon some peculiarity of the subject in which it occurs.

In considering the phenomena of a fit of gout, there are certain circumstances, or rather, I should say, certain symptoms which call for special mention. Perhaps the most striking of these is the part affected. In first attacks, the metatarsophalangeal articulation is most usually implicated, and when exceptions to this rule do occur, they are due to accidental circumstances, and are most frequently met with in those people who have acquired the disease. In 516 cases, noted by
 Sir.

Sir C. Scudamore, the great toes alone were the parts first affected in 341 cases, and the great toe along with some other part in 373 instances. In point of frequency, the ankle is the next part most usually attacked, afterwards the instep, next the outer side of the foot, and then the knee. From this it will appear that the term *podagra*, as descriptive of the part affected in first attacks of the disease, a term which was used by many ancient writers, and adopted by Cullen, contains the general truth, yet so much exception prevails, as to render it too limited a term even to mark the first fit. The extreme frequency of the affection first locating itself in the ball of the great toe cannot be looked upon as a mere fortuitous occurrence — as a mere coincidence, and must, as we shall afterwards see, have something to do with its pathology.

(B) Tendency to periodical recurrence. This is sometimes very well marked, being sometimes punctual almost to a day in its annual visits. Sir C. Scudamore records one instance in which the fit returned for three successive years on the 12th of April.

(γ) The character of the Pain and inflammation. Many authors speak as if these symptoms were in

in relation to each other as cause and effect, and that the pain is produced by the inflammation of the synovial structures of the joints. That the pain is due to inflammation, I admit, but I do not think that it is the pain of ordinary inflammation, but of neuralgic inflammation and Dr. Haycock insists upon this point in his Nosology of Fevers. I have come to this conclusion from the consideration of the following particulars. (1.) The pain is very intense and resembles very much the pain attending neuralgic affections in other situations. A French author writing upon gout, and attempting to give his readers an Idea of the pain, says, "Place your joint in a vice, & screw the vice up, until you can endure it no longer. That may represent rheumatism. Then give the instrument another twist, and you will obtain a notion of the gout." I have heard an individual who suffered from this disease, say that the above was not an inapt comparison. (2.) The pain is different in character from that produced by an ordinary injury, or by inflammation occurring in other joints, and not due to gout. A gentleman for example, who broke his leg, and then had an attack of gout in the opposite great toe,

toe, expressed his opinion that the pain in the latter far exceeded that in the former. (3) The pain, in some instances does not appear to be so intense, although the inflammation may run high, and this has been known to occur even in first attacks.

(4) The occurrence of oedema and of subsequent desquamation of the cuticle is another peculiarity of gouty inflammation, when it attacks superficial structures, and is sometimes of considerable value in diagnosis. During the early part of the attack the oedema is not so easily made out on account of the great tension; but when the severity of the inflammation is over, pitting can readily be detected. With regard to the cause of oedema occurring so frequently in connection with gouty, as compared with other forms of inflammation, nothing very satisfactory has as yet been made out. Dr. Garrod thinks it may be due to the presence of impurities in the blood - such as urate of soda and a small amount of urea, in the same way as the oedema occurring in connexion with renal disease, is associated with, and supposed to be due to the presence of impurities in the blood. A more probable hypothesis, I think, is, that it is due to

to some change in the innervation of the vessels of the part, permitting their contents to exude. The desquamation of the cuticle is a subsequent symptom, taking place after the complete subsidence of the gouty paroxysm. It is often slight and is said not to be present in all cases, but it is a symptom which is easily overlooked, unless specially looked for. Out of 234 cases recorded by Sir C. Scudamore, it was present in 156 or $\frac{2}{5}$ of the whole number. It seems to bear some relation to the amount of previous oedema, and consequent distension of the skin, and is frequently preceded and accompanied by considerable itching.

(E) Temperature of the affected part. Patients frequently complain of great heat in the part, but the thermometer shows no more increase of temperature than is found in ordinary inflammation elsewhere.

The sensation of increased heat is probably due to 2 causes. (1) To the slight increase of temperature due to the inflammatory action; (2) To a peculiar exaltation or perversion of the nervous function.

(F) No tendency to suppurative inflammation. This is the most important distinction between gouty and ordinary inflammation of the joints. Any person seeing for the first time in his life an attack

attack of gout in its full intensity, and possessing a little knowledge of surgery, would probably think that the inflammation must necessarily terminate in suppuration. Indeed, ⁱⁿ the first case of gout which came under my observation, I fell into this mistake. As this case made a great impression upon me, and afforded me a useful lesson, I shall give a short abstract ^{of it} from my case book. E. J. a female, at: 33. married; no family; no hereditary taint made out; had been a house-keeper in a gentleman's family up to 3 1/2 years ago, and had made 'pretty free with the good things of the house.' She had enjoyed pretty good general health; had suffered occasionally from dyspeptic symptoms; never had any disturbance of the menstrual function. Three and a half years ago, she left her situation, took to drinking, and brought on a fit of gout in the left great toe. For this, she was under treatment in the Infirmary, and recovered her health perfectly. Previous to her present illness, she had suffered from some of the ordinary, premonitory symptoms of gout, which she attributed to disorders of the stomach, brought on by indulgence in drink. The above history was obtained by corp. examination at a subsequent visit; but at first visit on

on entering the room and asking what was the matter with her, she told me she had got a sore foot, and that she had had it for two days. On asking to see it, she removed a large *Sorridge* *Pauline* from it, and the ball of the left great toe was seen to be very red, tense looking, and presented a peculiar shining or glistening appearance; the part was also very painful. Looking at the appearance of the part, I concluded at once that it was an inflammation brought on by some injury, and would very likely lead to suppuration. The pain and tension, I thought, would be relieved by a few incisions. I accordingly proposed this plan of treatment to the patient, and, amazed at my ignorance, she said, in broad Scotch, "D'ye no ken what it is? 'tis the goat, man." On making a little enquiry into her history, I came to the conclusion that her diagnosis was correct, and mine wrong. I pocketed my bistoury, and ordered her \overline{m} \overline{ss} of *Colchici* *ter* *die*, a simple purge immediately, and to keep the part affected rolled up in flannel. She was ordered to lie in bed, and take simple farinaceous food. In the course of a week, she was well, no suppuration followed, but a few weeks later, the right great toe became

became affected, and the attack ran its usual course, and proved amenable to the same treatment. Apologizing for this digression, I resume, and state that in my opinion true and pure inflammation is never followed by suppuration, and when suppuration does occur in connection with gouty inflammation, other causes are present to account for it. Sir C. Scudamore regards it as extremely rare; he only met with 8 cases, and in each the result was curiously modified by a secretion of urate of soda; probably there had been a deposition of urate of soda previous to the attack, and the abscess was caused by the irritation set up around a foreign body. In some cases, noted by Ferrius, the same thing seems to have taken place. He also says that he never saw it take place in a first attack, nor is he aware of its ever having been noticed to occur during the first fit.

Future Progress of the Disease

Occasionally a patient experiences but a single attack of gout, but this rarely happens, if his life is prolonged. The interval between the first and second fit varies considerably in different persons, depending upon the patient's constitutional tendencies, his mode of life, and the amount of

of exciting or predisposing causes to which he is subject. As the disease advances, the interval between the attacks becomes less, and the disease itself, if it have first fixed upon the great toe, has a tendency to travel upwards, affecting first the ankles, then the knees, and afterwards the hands and elbows, and still later other joints of the upper and lower extremities. The early attacks are not usually followed by any very appreciable evil consequences, and as one of the effects of a severe paroxysm is to relieve the blood of the impurities which had been lurking there for some length of time, patients often express themselves as benefited by the occurrence of the gouty fit. The truth, however, is, that every attack is attended with permanent local mischief, which although generally slight at first, may by frequent repetition be sufficient to induce serious inconvenience. There are some cases in which the formation of chalk stones occurs very shortly after the first fit, and even in two or three years increases to such an extent as to cripple the patient. Occasionally also, acute gout will cause permanent stiffness, and anchylosis even in its first attack. —

Chronic

Chronic Gout.

After gout has existed in any person for a length of time, it comes to assume the ~~the~~ characters of a chronic malady, and is spoken of, and described, as Chronic gout. It does not cause so much suffering as the acute disorder, yet by its longer duration, and almost constant presence, it is apt to ruin the patient's health, and by the formation of chalkstones, leading to distortion and rigidity of the joints, embitters the patient's life, making him perfectly miserable, and at last killing him by a fit of palsy or apoplexy. This, however, is by no means a constant occurrence, for the fits, if the patient takes proper care of himself, may become rarer and rarer, and even after a lengthened period, little or no apparent injury may have resulted from them. In the less favourable class of cases, the fits become more frequent and less regular, and instead of being annual only a month or two may elapse between the attacks, and a fresh fit may frequently come on before the disappearance of the preceding one, so that in some cases the patient is never free except for two or three

months in summer. Sometimes it is confined to one joint, sometimes numerous articulations are involved, and not unfrequently it travels from one joint to the other. This form of gout seldom continues long in one place without giving rise to some serious and permanent change of structure, either partial or complete ankylosis, or the formation of the so-called chalkstones around the articulations or in other parts of the body. The occurrence of these so-called chalkstones, or tophaceous concretions, as they have also been called, is quite characteristic of gout, and distinguishes it from all other diseases. These deposits were well known to the ancients and gave rise to much curious speculation. Sydenham looked upon them as true gouty matter. Besides being found near the joints, they have noticed to occur in different and very unlikely parts of the body. Their most frequent seat is the helix of the ear, and when found on the ears, they will usually be found in other situations also. They have also been noticed on the cartilages of the nose, the eyelids, and even on the penis.

Jf.

Table of Analyses of Sphaceros deposits

Name of Chemist	Site from which taken	Urates of Soda	Carbonate of Ammonia	Urates of lime	Chloride of Sodium	Phosphate of lime	Animal Matter	Water -	Loss
Marchand	over fence close to k. pond	34.20	7.86	2.12	14.12	—	32.53	6.80	2.37
Lehmann	Metacarpus	52.12	—	1.25	9.84	4.32	28.49	3.2	9.8

If one of these tophi of recent formation, be punctured, a semifluid cream like matter issues, soluble in hot water, and giving rise on cooling to crystals of urate of soda. If the deposit has lasted a longer time, it will be found to be in a semisolid or solid state, but if it is emulsified and beaten with hot water, it gives rise to similar appearances. They are in the first instance probably poured out in the form of a limpid fluid, rich in urate of soda (a very sparingly soluble salt,) and gradually harden from absorption of the fluid portion until they acquire a very firm consistence. Their true composition was first truly demonstrated by Dr. Wallaston, and subsequent chemists have confirmed his analyses. They consist chiefly of uric acid in combination with Soda, and small quantities of phosphate of lime, chloride of Sodium, and organic matters.

When the deposit is slight in amount, it may cause partial or complete ankylosis without visible enlargement of the joint, or any appearance of deposit, but if the attacks of the disease are often repeated, a distinct bulging of the joint will be observed, and sometimes white spots are seen beneath.

beneath the skin, showing the approach of urate of soda to the surface. As these deposits enlarge, the skin over them becomes thinner, and the cuticle at last gives way, permitting the escape of small fragments. A very curious case is recorded by Mr Henry Watson (in Vol. I of Medical Communications (1782.)) of a man, who was accustomed, when playing at cards, to chalk or score upon the table the number of the game with his gouty knuckles. Sometimes, as before mentioned, the concretions, acting as foreign bodies, set up suppurative inflammation, followed by ulceration, and often proving very difficult to heal. If the deposit is very extensive, occurring in many different joints, and crippling the patient, it is usually due to some debilitating or depressing cause, or to some serious injury.

Before proceeding to describe the morbid anatomy, the etiology, and pathology of Gout, it will perhaps be better to introduce here a short account of the changes which the blood and urine undergo in this disease. More especially, as great advances have been made in this department within these last few years.

On

On the Condition of the Blood in Gout.

The corpuscular element is by no means necessarily altered in the acute sthenic affection, but in chronic and asthenic cases, as in any other debilitating disease, they are often notably diminished. Whenever lead enters the system, it is found to produce an anæmic condition of the blood, and consequently in gout occurring in painters, plumbers, and other workers in lead, it is common to find a diminution of the globules, due to the metallic impregnation and not to the gout.

The fibrin in acute cases, as in other inflammatory diseases increases in proportion to the intensity of the inflammation, but in chronic cases, it is nearly normal. When drawn from the vein, it may on cooling, exhibit the buffy coat, or it may be both buffed and cupped, or it may present no unusual appearance.

The specific gravity of the serum has been found lower in gout than in any other disease with the exception of albuminuria, and scorbutus. This fact is not noticed in the acute disease, but only after it has lasted for a long time and is accompanied by defective nutrition, or well marked kidney disease.

The

The chief deviation from the normal ^{Condition} ~~state~~ of healthy blood consists in the increase of those principles which exist in health in such minute traces as to be detected with great difficulty. These principles are urea and uric acid. They have been shown to exist in healthy blood by Strahl, Lieberkühn, and Dr. Garrod, but Dr. Garrod was, I believe, the first to demonstrate their increased quantity in the blood of gouty subjects. Dr. G. has discovered a test which will not detect uric acid as it exists in healthy blood, but if it is increased in quantity even if the increase be as slight as 0.025 gr. in 1000 gr. his experiments, which he calls "The Uric Acid Spread Experiments," will detect it. Now in all cases of gout, uric acid ^{in the form of urate of Soda} is found in much greater amount than this in the blood.

According to Dr. Budd and Garrod, urea is often contained in abnormal quantities in the blood of people suffering from gout. During the inflammatory stage of gout, oxalic acid in the form of oxalate of lime, has frequently been found in the blood, the result probably of the disintegration of the uric acid which occurs at that time. It may be as well perhaps in this place to speak of The

The Secretion of the Skin in Gout.

Swediaur noticed in one of his patients that the skin was every day covered with a whitish powder. Others have noticed a similar occurrence.

This powder is supposed to be due to the presence of uric acid generally in combination with Soda. It has even been alleged that uric acid itself has been found in the secretion, but this is doubtful.

Condition of the Urine in Gout.

(I) In the acute disease.

It has long been a prevalent opinion that there is always an excrep of uric acid thrown out of the system by gouty individuals, and especially when suffering from the acute form of the disorder; but more recent analyses have shown that the average amount of uric acid excreted by the kidneys in 24 hours, during a fit of gout, is not necessarily increased, but is frequently diminished.

Bequerel in his "Semeiotique des Urines" fixes the average amount of uric acid excreted in 24 hours, at 8 grs, whereas the average amount of uric acid excreted during a fit of gout was found to be 3.62 grs. (Garrod). The error of saying that that the uric acid was in excrep arose no doubt from

from

from the fact, that during the height of the febrile disturbance, the urinary secretion is scanty; its acidity is increased, and nearly the whole of the uric acid is thrown down, and from its tendency to attract the colouring matters of the urine, it appears greatly increased in amount, whereas, as already mentioned, it is really diminished.

An important question here arises— Does this diminution in the daily amount excreted by the kidneys depend upon defective elimination by the kidneys, or from any diminution in the formation of this principle by the economy?

That the former is the true cause is proved by the fact that when the uric acid is greatly diminished in amount in the urine, it is very abundant in the blood (Serum of)

During the fit, the amount eliminated by the kidneys varies; at the beginning of the fit this is usually small; it then increases in amount, & then diminishes as the fit passes off. Urea is excreted in most cases in normal amount.

Traces of albumen are not unfrequent, especially as the disease advances, and deposits of urate of soda are found; although in the interval no trace of albumen can be detected.

When

When the patient is free from an attack, and only complaining of pain and uneasiness in the joints, the urine presents the following characters: - Usually it is pale, - below the average tint of healthy urine, density sometimes increased, sometimes diminished; the amount of urea, considering the patient's diet is normal; the uric acid is diminished, but varies greatly in amount, being often under 1 gr. in the 24 hours, and rarely exceeding five gr. Albumen is also very frequently present.

In persons who have suffered from repeated attacks of gout, but who are at present free from the disease, the uric acid excreted in the 24 hours is diminished in quantity, far below the healthy standard, but the blood often contains an increased quantity. The urea is generally in normal amount.

Microscopic examination of urine in Gout.

In the early stages, the urine frequently presents a deposit of urate of soda, either amorphous, or in masses and groups of spicula; or uric acid may be present; or the two may be combined. As the disease advances, along with

The small amount of albumen usually present, tube casts have been detected, generally of a granular character, indicating that a desquamative process is going on, from the lining membrane of the uriniferous tube, a change closely associated with the deficient secretion of some of the elements of the urine, and more especially of the uric acid. In more advanced forms of the disease, these granular casts are often replaced by waxy or fibrinous casts.

In the latter stages of gout, copious deposits of uric acid or urates are not often met with, and the urine becomes much brighter and more normal in appearance. The patient is apt to flatter himself that his health is going to improve, whereas it is in reality an indication that the kidneys are becoming deficient in their powers of eliminating uric acid. Sometimes uric acid is excreted in an intermittent form, often absent for a while, & then suddenly returning. Oxalate of lime is not infrequently found in gout, but as it is found in connection with so many other diseases it is of no diagnostic value.

Morbid Anatomy of Gout.

Many careful dissections have been made of persons who have died, either during or shortly after a fit of the gout, from a fit of the gout, and of those who have died exhausted from the long continuance of their tormenting malady. Reports of such dissections have been published by Morgagni, Dufresne, Crucilhier, Mours, Bence Jones, and Garrod. And from an examination of such reports, we may safely conclude that gouty inflammation is always accompanied by the deposition in the part affected of a peculiar salt, urate of soda; and as the inflammation is liable to attack various tissues, so also the deposit may be found in various situations. Sometimes in severe and protracted cases, these deposits are superficial, on the cartilages of the ears, on the surface of the fibrous tissues around the joints, and sometimes within the joints themselves. The synovial fluid of the Cavities becomes thick, and now and then even of the consistence of plaster, which on examination, is proved to be due to the presence of urate of soda.

The joints are often either partially or completely ankylosed by the rigidity of surrounding ligaments, and some of the smaller joints, especially those of the great toe, are occasionally so completely surrounded with deposit as to exhibit the appearance of being enclosed in a bony or chalky case. The cartilages of the joints that have been affected, are found encrusted with urate of soda, but on careful examination, it will be seen that the deposit is not on the free surface of the cartilage, but is entirely interspersed in its character, and generally a thin layer of synovial membrane will be found separating it from the cavity of the joint. Cruveilhier states that small deposits often exist within the bone itself as in the astragalus of one case he mentions; but such an occurrence must be rare, as it has only once or twice been noticed by subsequent observers, and in the analyses of the bones of gouty subjects, made by Lehmann, and Marchand, no mention is made of either uric acid or any of its salts. Another fact has been noticed by Dr Budd and it is this, - that the urate of soda appears to avoid the contiguity of bloodvessels, for he noticed that towards the edges of the larger cartilages

Cartilages, where the blood vessels are abundant, there is usually little deposit, but where the vessels are scanty, there the deposit is abundant.

Appearance of the Kidneys in Gout. They are diminished in size, weighing from $2\frac{1}{2}$ to 3 ounces, (normal weight about 5 oz.). They are pale and contracted, the cortical portion is shrivelled, points and streaks of white matter are seen at the apex of each Pyramid, and running up in the direction of the tubuli uriniferi. The amount of deposit in the kidneys, as also in the joints, varies according to the duration of the disease; and if there is no deformity of the joints, and only few small nodules on the ear, the amount of deposit in the kidneys is less, although it is always present. If a patient has died after having ^{had} only one single fit of the gout, and an opportunity be afforded of examining the joint after death, a small deposit of urate of Soda will in all likelihood be found, as in all cases of such a nature that I have read of, such an appearance is noted. The establishment of this fact is important, and points to the conclusion that gouty inflammation is always of a specific character. A microscopic examination of any of these deposits

will at once shew their true character, as no other crystalline salt presenting similar microscopic characters ^{to urate of soda} ever occurs in the same situation -

Microscopic Examination of the Kidney. The white points and streaks formerly referred to present microscopically the appearance of urate of Soda; and the occurrence of these crystals is characteristic of gout. The contracted and atrophied organ is found sometimes in albuminuria, but in no other disease do we find the presence of urate of Soda as indicated by the white streaks. If the kidney be examined in the early stage of the disease, when there is no appreciable abnormality to the naked eye, the microscope detects an altered condition of the epithelial cells of the convoluted tubes. Upon this point, Dr. G. Johnson, who has paid much attention to renal disease, remarks: - "In some tubes, there is an appearance of entire cells, having been shed so as to fill the tubes, & render them opaque; while in others, there is an equal filling and opacity of the tubes from containing epithelium in a disintegrated condition and which has become so, either from the crumbling

crumbling of the cells while they are still attached to the basement membrane, or from the disintegration of the epithelial cells, which accumulated in the tubes after they had been shed in an entire form by a process of desquamation?

In concluding this part of the paper, I must allude to the occurrence of gouty matter in other organs, and I must here express my regret that observers should call those deposits gouty which occur in the hearts, lungs, brain &c, simply because the person who died from them was gouty, and without making any chemical or microscopical examination of them, for we know that calcareous deposits, and especially phosphates of lime, are not uncommon in these situations. Schönlein is said to have detected urates in the meninges of the brain of a gouty old gentleman, but I do not know of any similar case on record.

Obituary

Etymology of Gout.

The causes of Gout are usually considered under 2 heads.
 I. Predisposing Causes. - II. Exciting Causes.

[I.] Of the Predisposing Causes of Gout. - Some manifestly depend upon constitutional peculiarity, or are inherent in the individual; others are from without or produced by external influences.

(1) On hereditary Predisposition as a cause of Gout.
 Cullen believed it was purely hereditary, but abundant evidence has since been brought forward to show that the disease is occasionally acquired. Out of 522 cases collected by Scudamore, the hereditary Predisposition could be traced in 332, or in the ratio of 322 to 190, but taking those cases in which the Predisposition could be considered immediate, i.e. derived from either or both parents, the ratio would be 258 to 264. Similar percentages have been noticed by other authors. But on the other hand the gouty habit may frequently be acquired, even in this country, and become manifest at an early age, & even prove inveterate in Patients who cannot trace the most remote hereditary taint. When a predisposition exists, it is said that the disease comes on earlier in life than when simply acquired.

(2) Influence

A table illustrative of influence of age
in production, or occurrence of Gout.
(Scudgumoria)

Occurrence of 1 st fit -	No. of Cases	Occurrence of 1 st fit -	No. of Cases.
Under 10. yrs.	1	35 - 40 yrs.	89
10 - 15 -	2	40 - 45 -	64
15 - 20 -	10	45 - 50 -	54
20 - 25 -	57	50 - 55 -	26
25 - 30 -	85	55 - 60 -	12
30 - 35 -	105	60 - 65 -	8
		at age of 66 - 2 cases -	

(2) Influence of Sex. That women are less susceptible to gout than men, is, I think, unquestionable; and the reason of this comparative immunity of the fair sex, will perhaps be found in the fact that they are less exposed to those causes which tend to the development of the disease. When it does occur in women, it is generally hereditary and very rarely acquired. —

(3) Influence of Age. Youth enjoys almost complete immunity from gout. Cases are recorded of its occurrence before puberty, but these are rare. I only know of one case of a person hereditarily predisposed to gout, who, at the early age of 7 years, suffered from an inflammatory attack of the big toe, and which was cured by the anti-gouty plan of treatment. The medical attendant pronounced the attack gouty, but as no recurrence of the ~~attack~~ ^{case} has taken place, and the patient is now 22 years of age, the diagnosis may be considered doubtful. I shall, however, continue to watch the case for any gouty symptoms, that may become developed. The period of life most exposed to gout, as seen from the table on the opposite page, copied from Scudamore's work, is from 30 to 35 years.

(4) Influence of Diathetic tendencies. There are two diatheses which especially predispose to gouty diseases. These are the sanguine and the bilious arthritic diathesis. I extract from Dr. Laycock's work ("on Medical observations and research") the characters of each.

Physiognomy of the Sanguine arthritic or the sthenic form of the arthritic diathesis. External characteristics are as follows: - Blood vessels numerous; heart large and powerful; blood corpuscles numerous; skin over malar bones highly vascular, giving a floridness to the complexion. Skin fair, firm, oleaginous, perspirable; eyes blue; hair thick, not falling easily; teeth massive, well-enamelled, regular, even, undecayed in advanced life; malar bones flattened; head symmetrical; nasal bones well formed; nose aquiline, or of mixed form; lower jaw mapy; lips symmetrical. Form. - Figure for the most part tall; thorax broad at summit; ribs well curved; abdomen full; muscles firm, large; limbs large, robust; gait erect, well poised. Nutrition active; digestion vigorous; appetite great for animal food, & alcoholic stimuli. Respiration deliberate, deep; circulation vigorous; animal heat abundant; locomotion; aptitude for exercise or outdoor amusements. Reproductive powers active; im-

, ration

vation abundant; the mental powers vigorous and enduring. Frequently seen after 40, & tends to prolong life. The predisposition to disease in the Arthritic diathesis may be general, and consist in the retention of urea in the blood, or in its too rapid production; or, local, and consist in inflammation, or inflammatory irritation of the products of the serous layers of the embryo, ending in calcification or bony change. When the retention of the urea is associated with a depraved blood-crisis, or with visceral disease, the arthritic cachexia is developed. The diathesis is modified by age and sex. It is shewn most purely and distinctly when nutrition is most active, and visceral disease at a minimum. In male children, by lithiasis; by eruptive diseases, principally congestive; and by an abnormal appetite for animal food; in male children about puberty by Epistaxis, hemophysis, and functional cardiac disorder. In middle age, by Gout; by hepatic and cardiac congestion; by hemorrhoids; and often by chronic congestion of cheeks and nose.

The arthritic predispositions in women have not been well studied, and little is known of the arthritic diathesis and cachexia, as it occurs.

occurs in women. They predispose at puberty to hysteria in anomalous forms; to varied neuralgias; nephritis; hysteritis; acute cutaneous inflammations; and toxicarious urinary and menstrual discharges.

The arthritic cachexia in the female predisposes to chronic skin diseases, especially desquamative chronic erythema of cheeks and nose; to chronic inflammation of uterine cervix, and in the decline of life to nodose fingers & joints, & to rheumatic gout.

Physognomy of the bilious asthenic arthritic diathesis. Blood vessels few; blood corpuscles an average or below par (oligemia); no capillary development over malar bones; complexion tending to olive; hair dark; teeth small; features and limbs small; tendency to embonpoint; appetite feeble; circulation feeble; caloric powers defective; hepatic functions imperfect; predisposition to gout at an early age, and in the females of a family as well as the males; to struma; to tubercular hæmoptysis at puberty; to cataract; to atonic gout; to nephria, and to chronic purpura at more advanced ages." Sometimes, this diathesis is complicated, and while still of the asthenic type is characterized by a tendency to tubercular deposit, or else by fatty rather than by albuminous or calcareous changes in the tissues.

(5.) Influence of fermented and distilled liquors.

The use of alcoholic liquors is one of the most powerful of all the predisposing causes of the disease. There is a considerable difference in the power of each in producing the disease, and that this varying power does not depend upon the amount of spirit they contain, is proved by the fact that distilled spirits, such as whisky, &c, when taken alone appear to exert little or no influence in the production of the disease, whereas with wines, strong ales and porter, the reverse holds good. Van Swieten says that gout was little known in Holland until wine was introduced as a substitute for beer, and Linnaeus, from his observations on the Laplanders, concluded that wine was almost the sole producer of gout, seeing that they (the Laplanders) partook plentifully of malt liquors, and among them, gout was unknown.

Although malt liquors are not so potent as wines in the production of Gout, they are by no means unoperative, and many cases are on record of men consuming large quantities of porter and strong beer, and in whom no hereditary predisposition could be traced, becoming the subjects of gout.

The wines ordinarily in use in this country, as port, sherry, and other stronger varieties, appear to be the

most

most potent, but we must also remember that those who are in the position to procure large quantities of wine, are also in a position to procure other delicacies, and especially the luxuries of the table, - circumstances which greatly favour the development of the disease. The lighter French wines, although capable of exciting a paroxysm in a gouty subject, have comparative little power in inducing a predisposition to the disease. Stout and Porter rank next to wine in their power of producing the disease, and consequently gout is not uncommon in men employed in large breweries. Strong ales and even bitter beer exert a similar influence. In some of the countries in the South of England, where cider is much used, gout is very prevalent, and Cider has got the credit of producing it. I do not think it is entitled to this credit, for Dr Wood remarks that in New England, where cider is much used, gout is comparatively rare. ~~Gout~~, I think, more likely to be due to the cider being impregnated with lead by being kept in leaden tanks. That the cider is sometimes impregnated with lead to such an extent as to prove injurious is well known, for only a few weeks ago, I noticed in an English Paper, that

Several

several members of one family in Devonshire had suffered from the symptoms of lead-poisoning after partaking freely of cider. Although I believe that cider has no power as a predisposing cause of gout, yet I believe it is a very powerful exciter of a paroxysm in a gouty subject. The question now arises. Why do different alcoholic stimulantes possess different degrees of potency in inducing gout? The influence they possess certainly bears no direct ratio to the amount of alcohol they contain. Is there any difference in their composition to account for this? All the wines are more acid than malt liquors, but the presence of acidity won't at all account for it, for port and sherry, which possess considerable power in inducing gout, are among the least acid wines. No direct ratio can be established between the presence of sugar, and the predisposing power of any alcoholic beverage. Little is known respecting the saline matters of wines & other liquors. None of the known principles contained in these liquors can as yet be proved to impart to the alcohol its predisposing influence, for wines the least acid, & liquors the least sweet, are often the most baneful.

6. Influence of excess of animal food and defective exercise. Cullen remarked that gout seldom attacked those engaged in constant bodily labour, or those who live much upon vegetable diet, but on the other hand, the disease is far from being unrequent in those who partake of highly seasoned dishes, and who consume a quantity of nutriment far above the requirements of the system. This may be explained by the fact (established by Lehmann from experiments on himself) that a large excess of highly nitrogenized food, tends greatly to an increased secretion of uric acid, which we have mentioned as bearing a close relation to the development of gout. Excess of food may also act by impairing the digestive and assimilative functions, and producing dyspepsia, and observation has shown that that form of dyspepsia, which tends most to the development of the gouty diathesis, is accompanied by an increased elimination of uric acid.

7. Influence of severe study and mental anxiety. Severe and prolonged study, almost necessarily conjoined with a sedentary life, tends greatly to lower the tone of the secretions, especially of the urinary, at the same time

time that it impairs the power of digestion, and hence ensue not only a defective excretion of some of the principles of the urine, but likewise their increased formation. Many talented men, by their severe mental labour have not only caused the development of the diathesis in themselves, but oftentimes, caused a recurrence of the disease. Sydenham wisely remarked: for the special comfort of himself and others suffering from the disease, and but moderately furnished with money and the graces of the mind, "that so lived and so died, great kings and potentates, generals of armies, and admirals of fleets, Philosophers and many other such as these. That the disease kills more rich than poor, more wise than fools." And in the present day, Cabinet ministers and politicians, and many others, distinguished by their talents and arduous application frequently become martyrs to this disease. On the other hand, depressing emotions as sorrow, chagrin, &c. have been known to engender the gouty habit.

(8) The influence of Venereal excretes was at one time much insisted upon, but their real influence is often difficult to define, inasmuch as they are frequently associated with immoderate indulgence in intoxicating liquors. Hence the gout is

is, by the poet, saluted daughter of Bacchus
and Venus.

Λυσιμελου Βάκχου και λυσιμελουσ Αφροδιτης
Γενναται θυγατηρ, λυσιμελης Πιοδερρα

(9) Influence of climate and season. There are so many influences invariably connected with climate, that it is very difficult to separate the one from the other so as to determine their relative influence. Gout is, however, undoubtedly less prevalent in hot than in temperate climates. In the interior of Africa, it is according to Dr. Livingstone, unknown. I am told by students from India that it is unknown there except among European residents. It is less frequent in Italy than in France, and in the latter country, it is less prevalent than in England. But whether this is due to climatic influences, or not, would be difficult to determine, inasmuch as the inhabitants of these different countries are exposed to the predisposing causes in various degrees. For example, we know that in Rome under the republican government, gout was little known, but under the Empire, when luxury and indolence prevailed, it became extremely common. The influence of season is often shown at an early period of the disease, in determining the period of the attack rather than in developing the malady. Sydenham said that

that during the end of January or beginning of February, the disease usually breaks out, and subsequent writers have borne testimony to the correctness of this statement. During the summer months, gouty patients, as a rule, suffer less from the disease, although remarkable exceptions to this rule frequently occur.

(c.) Influence of lead in producing gout. Dr. Garrod was the first to notice and make public the frequency of gout among workers in lead. (Med. Chir. Trans. vol. xxxvi. 1854). At least one in four of the gouty patients who came under his care, had at some time of their lives suffered from some of the effects of lead in the system. Seeing this to be the case, he was led to make some experiments, from which it would appear that lead has the power of diminishing the excreting power of the kidneys for uric acid, and consequently there is an increase of that substance in the blood. But an increased amount of uric acid in the blood is not found in all cases of lead poisoning. After the administration of lead medicinally, the uric acid in the urine is frequently diminished one half.

Exciting Causes of Gout. Several of the predisposing causes, will if increased in intensity act in immediately exciting a fit of the gout. The amount of an exciting cause

Cause necessary to produce an attack depends greatly upon the proneness of the patients system to take on gouty action, and we frequently witness attacks of gout apparently produced in one patient by a trivial irregularity which in another would be productive of no inconvenience; as. e.g. exposure to cold, mental emotion &c.

(1) Alcoholic Beverages as exciting causes.

The drinking of an unusually large amount of an alcoholic fluid is frequently the cause of the attack, but I have known an attack brought on in a gouty individual by drinking a single glass of wine; on another occasion, the fit appeared after drinking a glass of strong ale. Some patients may drink certain kinds of wine without getting a fit, whilst others, if they even take in moderation of the same wines are sure to suffer. Some suffer from taking champagne, others from port, and others again from strong beer.

(2) Dyspepsia. Patients frequently attribute their attacks to certain articles of diet, inducing disorder of the digestive organs. Highly seasoned dishes, different varieties of alcoholic beverages taken at dinner, by inducing indigestion, often hasten on a gouty Paroxysm.

(3) Cold and moisture although incapable of inducing a gouty

a gouty diathesis, act powerfully, as exciting causes of the paroxysm. The local application of cold, as getting the feet wet, will often be sufficient to excite a gouty paroxysm. Cold probably acts by arresting the secretion from the skin, checking the escape of acid usually thus eliminated, and thus rendering the blood less alkaline. Or, cold may sometimes act by its depressing influence on the nervous system.

(4) Severe mental or bodily labour, or sudden depression from any cause by lowering the tone of the nervous system, will induce a fit. Sitting up late at night, especially when combined with severe study, will often occasion an attack. Anxiety of the mind, fits of anger may occasion it. Great bodily fatigue may be the cause of it, as may also a blow or injury to the part usually affected, or if the patient has not previously suffered, the injury often determines the part affected. Hemorrhage by inducing depression may be the cause of a fit. The depression of the system after an exhaustive disease is frequently the cause. Finally, all causes which lead either to an increased formation of acidity, and its accumulation in the blood, or to the suppression of the natural acid secretion of the skin, and all causes depressing the nervous energy, and inducing defective excretion, have a powerful influence in exciting an attack of gout. -

Pathology of Gout.

The ancient Physicians looked upon gout as being produced by some morbid condition of the blood, but different views were held regarding the exact alteration in the condition of that fluid, some saying it was due to the presence of bile; others to phlegm, and others to a mixture of these fluids. Gophi were regarded as being due to their exudation and concretion. The ancient humoral pathology was strongly opposed by Cullen. He argued very ably, and consistently enough with all that was then known of the disease, against the doctrine of a morbid poison in the blood, and stated his own belief that gout is a disease of the whole system, or depends upon a certain general conformation, and state of the body. But as the general state of the system depends mainly upon its primary moving powers, therefore the gout may be supposed to be principally an affection of these, and as the primary moving powers are lodged in the nervous system, gout is manifestly an affection of the nervous system. His great argument against the humoral pathology was that no morbid poison could be shown to exist, and his other arguments had reference to this. As a morbid poison has

has been detected in the blood of gouty patients - it will be unnecessary to refute at greater length his arguments.

Forbes' theory. In 1793. Murray Forbes published a work upon Gout and Gravel, asserting that lithisic, (since called lithic or Uric acid) must be present in the blood in gout, as it was found deposited in various parts of the body, although he confessed his inability to find it in the fluids. He thought that tophi consisted of free lithisic and its deposition was caused by the admission into the economy of some other free acid. The latter part of this theory was proved to be erroneous in 1797 by publication of Dr Wallaston's analyses. About this time, Berthollet advanced a similar opinion with regard to the presence of phosphoric acid in the blood. He noticed that phosphoric acid is more sparing in the urine of gouty than of rheumatic subjects. Notwithstanding the publication of these theories, and the discoveries of Wallaston, the doctrines of Cullen continued to hold their sway in a modified form, and were for a long time supported by Scudamore, Barlow, and many others. Dr Gairdner's theory is somewhat different. He considers venous congestion as the first condition.

Epitheat

Essential to the formation of the gouty diathesis. He also says "there is a general state of vascular plethora of the great chylopoietic organs, and constant presence of varicose veins at lower extremity, that the heart is oppressed with a flood of returning venous blood, associated with an impure condition of this fluid, from the non-elimination of urea and urates, and probably, of biliary constituents, which cause the symptoms of disordered function of this organ.

----- But the greatest venous canals of the body, as well as the larger arterial vessels, are endowed with a resiliency which enables them to struggle well against the flood of returning blood. This fluid, then, is compressed between two opposing forces, that, namely, which is derived from the heart and arterial system, urging it forward on its course, and on the other hand the antagonistic resistance of the great veins leading to the right auricle. Under this compression, the vessels give way, and a true hemorrhage is ^{occasioned} ~~effected~~ in the part affected. If the rupture takes place in a minute capillary, carrying the serous portion of the blood only, a demid is the consequence, but if the vessel be one carrying red blood, a true ecchymosis is formed." He adds, "This view of a fit of gout may startle from its novelty, but I am thoroughly convinced from long observation of the disease

disease, that I have given the true rationale." He believes the pain to be due to distended capillary vessels pressing upon the extreme and sensible fibrilla of the nerves. Having briefly stated the hypothesis of Dr. Gaubius, it is now my duty to bring forward some arguments which to my mind regard the whole theory. With regard to the vascular plethora of the chylopoietic viscera, which Dr. G. says is always present. I admit that this state of vascular plethora is generally present in robust gouty patients, but in persons not robust, in persons early attacked with the disease, and in females, this state seldom, if ever, exists, at least no external manifestations of it are visible. Again, if congestion of the digestive organs be intimately connected with, and even a necessary antecedent of the gouty paroxysm, how does it happen that in diseases in which congestion of these organs is so prominent a symptom, the sufferers are not more frequently afflicted with visitations of gout? Again, many diseases of the heart, accompanied with congestion of the whole venous system, should, according to Dr. G.'s view, be followed by a fit of the gout.

I do bring forward no proof of the occurrence of hæmorrhage, which he thinks is the true rationale; he does not say whether he has ever
seen

the true
seen ~~at~~ ~~in~~ ~~the~~ ~~case~~ ~~of~~ ~~gout~~ ~~is~~ ~~alluded~~ ~~to~~; and as far
as the serum exudation is concerned, this occurs
in other affections besides gout, and may be ac-
counted for without assuming the very questionable
existence of vasa serosa

Before the discovery of an excess of uric acid in the
blood of gouty people, it was conjectured that
it existed there and formed the true materies
morbi. In opposition to the doctrines of Cullen,
Wollaston, Parkinson, Sir E. Home, Sir H. Haller in
this country, and Cruveilhier & B. Petit in France
advocated the humoral pathology.

The next theory of gout that I have to speak of, and
the one now generally held in the present day, is
that known as Dr Garrod's theory. In his capacity
of physician to a large London Hospital, he has
had large opportunities of studying this disease, and
has brought out one of the most readable, and at the
same time most scientific works on the subject of Gout
in the English language. From his various observations
and experiments, he concludes that gout appears partly
to depend upon loss of power, temporary or permanent
of the uric acid-secreting functions of the kidneys; the
premonitory symptoms and those also which constitute
the paroxysm, arising from an excess of the acid in the blood,
and

and from the effort to expel the *materies morbi* from the system. Any undue formation of this acid would favour the occurrence of the disease, and hence the connection between gout and uric acid gravel and calculi; and also the influence of high living, wine, Porter, want of exercise & in inducing it. It appears, also, probable that, as in albuminuria, the urea secreting function being chiefly impaired, we find a vicarious discharge of this body, in dropsical effusions; so in gout the uric acid-secreting function being defective, chalk-like deposits are produced, by a similar vicarious discharge of urate of soda. This hypothesis also explains the hereditary nature of the affection, and also its frequent occurrence in low states of the system; for we can understand that the peculiarity of the kidney may be transmitted, and likewise when the function in question is permanently injured, it will not require an excessive formation of this acid to cause its accumulation in the blood. These views of Dr. Garrod were first made public in 1848 in the *Med. Chir. Trans.* and since that time, he has added confirmatory evidence of their correctness derived from many experiments, which he has performed since that time. From what I stated in a previous part of this paper, it will be seen that in bone gout, uric acid is invariably present in the blood.

blood in abnormal quantities, in the form of Urate of Soda, both prior to and at the period of the seizure, and is essential to its production; but it has also been proved that this acid may exist largely in the blood without the development of inflammatory symptoms, as, e.g. in cases of lead poisoning. Its mere presence, therefore, does not explain the occurrence of the gouty paroxysm. Gouty inflammation, says Dr Garrod, is always accompanied with an interstitial deposit of urate of soda, in a crystalline form, in the inflamed part. This deposit may be looked upon as the cause and not the effect of the gouty inflammation. In proof of this, he says that when hipus little liable to take on inflammatory action, become infiltrated with urate of soda, but slight vascular disturbance is produced, this is especially the case with the fibrocartilage of the ear; and although we now and then meet with patients aware of the formation of the little nodules, who experience in fact a gouty fit in the ear, yet in most instances, attention has not been directed to the part so slight has been the inflammation caused by the effusion. The inflammation tends to the destruction of urate of soda in the ^{blood of the} part, and consequently of the system generally. The affection of the kidneys is at first functional but subsequently becomes structural. The premonitory symptoms of a paroxysm, and also many ^{anomalous} gouty symptoms.

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 Deposit
 information
 with
 p. 61

over

symptoms to which gouty subjects are liable, are probably due to an impure state of the blood. The causes which predispose to gout, independently of those connected with individual peculiarity, are either such as lead to an increased formation of uric acid in the system, or which lead to its retention in the blood. And the causes which ~~excite~~ a gouty fit, are those which induce a less alkaline condition of the blood, or which greatly augment the formation of uric acid, as e.g. aggravated dyspepsia or such as temporarily check the uric acid-breaking function of the kidney, as e.g. mental shocks, severe accidents, &c. ^{See foot.}

With regard to the diminution of the alkalinity of the blood causing the deposition of urate of soda, and thus exciting gouty inflammation, any one may easily satisfy himself by experiment; for example, take a solution of common phosphate of soda (which is the principle that gives its alkalinity to the blood) and dissolve some uric acid in it, but only to such an extent as to insure the fluid remaining alkaline. Then diminish the alkalinity by the further addition of a weak acid, and you will cause the precipitate of urate of soda. On this view we can reconcile certain apparent discrepancies in the class of exciting causes, e.g. some of them are of the same nature as those which predispose to gout, whilst others, however long their action be continued, will fail to ~~excite~~ the disease.

Before

Before concluding this part of the paper, I must say a few words in answer to the questions 'Why does gouty inflammation in its earlier attacks usually select the ball of the great toe?'

And why, in old standing cases, are the joints affected more numerous than in early attacks. 'The feet,' says Sydenham, 'are the genuine seat of the peccant matter, which may without doubt fix itself upon other parts; but in that case it is plain that either the progress of the distemper is arrested, or the patient's strength from repeated attacks is impaired' Van Swieten says that 'considering the difficulty with which the liquids pass through these parts, we may form no improbable notion why the gout is observed for the most part to begin in the feet: for these suffer a very great pressure upon the parts about the heel, having the weight of the whole body to sustain; and being far removed from the source of circulatory motion, the heart, they are subject to cold and moisture, and the liquids that are brought down to them through the arteries, by course of circulation ascending through the veins again, have the general effort of gravitation to overcome'. In addition to the remarks of Van Swieten; which are in great part true,

I have only to say that the great toe contains in abundance the ligures particularly prone to be affected, viz, ligures either of little vascularity, or ligures nourished altogether independent of bloodvessels. The metatarsophalangeal

how then is the matter reported

Phalangeal joint is also much subject to injury, and in many bodies, it bears more or less traces of injury. Again we know that certain Poisons are as it were attracted to particular Parts, and the external phenomena displayed by their action are usually symmetrical in form, as exemplified in many syphilitic skin diseases. As the disease becomes engrafted upon the system, the amount of urate of Soda in the blood is necessarily augmented, and as the cartilages and ligaments in the part first affected become encrusted with deposit, so that no further deposit can take place there.

Diagnosis of Gout.

Great Pains have been taken, especially by Heberden, to lay down the distinguishing character between gout and Rheumatism. In their typical forms the two diseases can scarcely be confounded with each other. The main points of distinction are principally as follows:

Gout is strongly hereditary;	Rheumatism is much less
much more frequent in males	distinctly so; — as frequent in
seldom occurs before puberty,	females; more frequent in
generally later; induced by	young, & before middle age, occurs
wine, malt liquors, & high living;	in weak, & not caused by wine, &c.
One or more of smaller joints, parts	cited by cold & damp. Large
circulating in early attacks, & especially great toe	joints, usually many, more affected
	by rest

Gout.

Great pain, edema and desquamation of cuticle. Does not induce acute inflammation of the structures of the heart.

Febrile disturbance moderate

Paroxysms periodic in early attacks. Early attacks lasting but a week or 10 days

Blood rich in uric acid
Constant deposition of urate of soda in inflamed cartilages and ligaments

Often leads to kidney disease - often produces chalk stones externally

Rheumatism

Pain less intense, seldom edema

Often causes acute peri- and endo-carditis

Febrile disturbance great, more than from local inflammation.

Never periodic

Attacks generally much longer.

No uric acid in blood.

No deposit of urate of soda.

No tendency to cause kidney disease.

Never causes chalk-stones.

Prognosis of Gout.

Is gout a curable disease? is a question which is often asked, and is one which is not so easily answered. It has long been a prevalent opinion both among the public, and even among the profession that gout is an incurable disease, and that a fit of the disorder is essential to rid the system of the impurities which have led to its production. But I have before stated that gouty attacks

attacks, although they may, in a certain degree be regarded as curative, are also destructive, and that a deposition of the morbid principle, invariably occurs in the inflamed joint, which must henceforth act in some degree as a foreign matter, and frequently lead to ulterior mischief. As regards the acute fit, it is quite as controllable, and as much under the influence of remedies as any other inflammatory affection. In the more chronic forms of the disease, much relief may be afforded to the patient, although little hope of ultimate cure especially if the joints are much crippled. If the crippling is to any great extent, and the pains attending the disease great, the patient's life is rendered severely miserable, and is often worn out by a gradual asthma. Gout when it attacks the extremities is not fatal; it is only fatal when it attacks some internal organ.

Treatment of Gout.

In this paper I intend to consider the treatment appropriate for the acute disease, secondly of the treatment of the chronic disease, and lastly of the treatment of the interval between the attacks, but gout being a specific inflammation, it must be remembered that each particular case requires a particular plan of treatment.

Treatment

Treatment of Acute Gout.

Bearing in mind that the inflammation is due to a particular state of the whole system, capable of modifying the various symptoms that may present themselves, we to a great extent follow the rules which apply to the treatment of ordinary inflammation of equal intensity. Enforce the antiphlogistic regimen, except perhaps under peculiar circumstances, but as the appetite is usually keen, this is sometimes difficult to do. The digestive functions are mostly weakened, and if the patient does indulge in animal food, he augments the impurity of the blood, and thus keeps up the febrile state of the system. For the first few days, until in fact the disease has shown a tendency to abate, the patient should be confined to a diet consisting of little more than diluents and farinaceous food. When the febrile disturbance has abated, and the local affection has become distinctly relieved, a return to a more nutritious diet, avoiding anything likely to cause indigestion; beefsteak at first, and then white fish, afterwards fowl or tender meat, not giving more than is absolutely required for the nutrition of the body. Malt liquors are to be prohibited. If alcoholic stimulants really necessary to promote digestion, a very small quantity of

of brandy and water, or of wine may be allowed, watching cautiously its effect. The patient should be kept in bed for the first day or two, until the severity of the febrile disturbance is past.

The medicinal treatment may be simply constitutional, or both general and local.

The constitutional treatment should be directed towards the diminution of the inflammation, and febrile disturbance, and the restoration of the blood to a healthy condition. The first of these indications is answered by giving

(1.) Purgatives. These remedies act no doubt by restoring functions previously deranged, as e.g. constipated bowels, hepatic congestion &c, and not by exerting any specific effect upon the affection of the joints, or upon the state of the blood. If given so as to cause marked depression of the system, they are very injurious, rendering the disease more liable to recur, and assume a chronic and often arthritic form. The amount of purgation must be regulated in each particular case, as must also the kind of purgative used. For example, if only constipation present, simple laxatives are best, as magnesia, rhubarb in the form of Pulv. Rhei co.; or Pul. Rhei co.; colocynth pill, or Black Draught. If the liver be in fault, medicines should be given which are known to act upon the liver, such

such as blue pill, either alone or combined with Colocynth, or Rhubarb at night and followed in the morning by a black draught. Saline purges occasionally do good in strong and plethoric ^{persons} habits.

(2) Emetics may afford relief if the stomach should happen to be greatly loaded and oppressed at the commencement of the fit, but of course exerts no influence on the progress of an attack.

(3) Mercurials do not exert any specific control over gouty inflammation, and should only be used as purgatives to relieve hepatic congestion. In advanced cases, they should be avoided on account of the kidney complication, as they are very apt to produce salivation under such circumstances.

(4) Diuretics and Diaphoretics. The secretion of the urine being usually scanty, the action of the kidneys may be promoted by the acetate, nitrate, or Bicarbonate of Potash; salts which also act by rendering the blood more alkaline and thus there is a double indication for their use. When the skin is hot and dry, and it is desirable to induce diaphoresis, the hot air bath may be tried, or the acetate of Ammonia, or sponging the body with water, or vinegar and water.

(5) Anodynes and Narcotics. Opium often speedily relieves the pain, yet when given in the beginning of the gouty paroxysm, Cullen says that it causes it to return with greater violence, hence we must if possible give relief by other means.

If Opium is really required, it may be given either in the solid form, in the form of tincture, or in the form of Pulvis Precipitatus & Opis. Other anodynes, such as Nuxbane or Belladonna, may be useful, where from some peculiar idiosyncrasy, opium is inadmissible and they possess an additional advantage: - they do not diminish the secretions. —

(6) Bloodletting can neither remove the impurity of the blood nor the deposit which has taken place in the inflamed structures. It is therefore of no use except to relieve general or local plethora.

(7) Colchicum Autumnale. That this drug possesses a great control over gouty inflammation is undoubted, and is admitted by most physicians of the present day. Some say it is as much a specific for gout, as Cinchona bark is for ague. It is to this drug that the quack remedies, Eau Medicinale D'Huson, Wilsons Tincture, and Reynolds specific, owe their popularity. Much discussion has arisen regarding its mode of action. That its effect does not depend upon its purgative action is proved by the fact that it is often useful without producing any purgative action. That its beneficial influence does not depend upon its powers of a vascular sedative is proved by the fact that it is not of equal service in other than gouty inflammations. Dr. Christison found that

number

under its administration for 2 days, the quantity of urea was nearly doubled in the quantity of urine examined, but no reference was had to the quantity of urine passed in the 24 hours, and although a given sample was richer in urea & uric acid, no proof was afforded that the total daily elimination was augmented. Prof: Chelius, of Heidelberg, thinks that it acts by increasing the secretion of uric acid by the kidneys, while Dr. Graves regards the power of colchicum as due to its lessening the formation in the system, and not to any increased elimination by the kidneys. Dr. Garrod concludes from his experiments that it does not act by increasing the uric acid-secreting function of the kidney, and if long continued, exercises a contrary effect. He does not think it has any influence upon the secretion of the urea, or the remaining solid portion of the urine, & so far from acting as a diuretic, frequently diminishes the quantity of urine. Some have said that it acts upon the nervous system as a sedative, but this experiment is of too general a character, and applies to many other drugs besides. At the present time, I do not know of any theory which satisfactorily explains the mode of action of colchicum, although I think that further investigation will prove it to be through the agency of the nervous system. The wine is the preparation

preparation generally used, and many prefer giving a full dose at first, say $\mathfrak{ʒ}i$ to $\mathfrak{ʒ}i\mathfrak{ss}$, and follow it up by smaller doses, as from $\mathfrak{m}\mathfrak{x}$ to $\mathfrak{m}\mathfrak{xx}$ two or three times a day, carefully watching its effect upon the pulse, and never allowing sickness or depression to come on. After taking it for some time, patients seem to acquire a tolerance of it, hence we must regulate the dose. Other preparations of the drug may be given for the active principle pervades the whole plant. The new Pharmacopoeia contains the extract, the acetic extract, and the wine, but other preparations have been much advocated, as the Tincture of the Seeds, and the ammoniated tincture.

(8) Veratrum album, which belongs to the same natural family as Colchicum (Melanthaceae), has been proposed as a remedy for gout, but is, I believe entirely useless.

Local Treatment of Gout.

(1) Leeches have often been tried, but experience does not sanction their employment; for sometimes their application has been followed by a transference of the inflammation, either to some other joint, or to an internal organ, sometimes by the occurrence of a diffuse form of inflammation.

2. Blisters

(2) Blisters. Dr. Todd has advocated the use of small blisters, about the size of a shilling or half a crown, and allowing the blistered surface to heal immediately. They seem to be most useful in cases of asthenic gout, where the inflammation has a tendency to linger in the articulation and cause liquid effusion. (3) The moxa was used by Sir W. Temple, and was of great use in many cases. (4) Hot fomentations, and poultices, or corded cotton, or soft new flannel, applied to the joint are very good. (5) Evaporating lotions were used by Scudamore. His favorite lotion consisted of a mixture of one part of spirit, and two parts of camphor mixture, heated to from 75° to 85° , and applied by means of linen rags. (6) Other local applications. When pain is very intense, preparations of Opium, belladonna, and acornite have been used. Some physicians looking upon gout as a local affection, have tried local applications of cold, as dipping the part into cold water, but serious results sometimes follow such applications, and hence they are now given up entirely. The celebrated water on gout, Dr. Mason Good, died, I believe, from putting his feet into cold water while suffering from this disease.

Treatment of Chronic Gout.

As in the acute disease, our treatment depends upon the idiosyncrasies of our Patients, so in chronic gout, it becomes very necessary to attend to these circumstances, as differences in this respect modify very materially our treatment.

As in Syphilis, many have attributed many of its general manifestations to the effect of Mercury on the system; so in Gout, many of the opponents of colchicum have attributed to its use, many of the chronic forms of this disorder, but cases have been observed over and over again of gout passing into its chronic stage, without any medicine ever having been given.

Medicinal Treatment of Chronic Gout. This must have especial reference to the condition of the blood, and be directed towards removing the impurities which this fluid contains. This object is best effected by attending to the various emunctories, and by attending to the circumstances which lead to the production of the disease.

The inflammatory state of the joints is best treated by small doses of colchicum; but as the inflammatory condition of the joints may often be kept up by old deposits in or about the joints, other remedies are required, and in these cases, Iodide of Potassium and Guaiacum are most useful. The Iodide of Potassium seems particularly useful in removing the remnants of

of the inflammation. The dose need not be large; from $\frac{gr}{2}$ to 1 gr: twice or thrice daily. Guaiacum is most useful when the circulation in the affected parts is languid, and relieved by the application of warmth. There is no danger in its administration, for any of its ill effects, as nausea, or purging are soon enough noticed by the patient. It may be given in the form of *Mistura Guaiacii*, or of the *Ammoniated Tincture*. When active inflammatory symptoms are present, its use is contra-indicated. Other stimulant remedies, as mezerion and *Serpentina* are sometimes useful. Our next object is to endeavor to restore the blood to a state of purity. The causes of this impurity, as before mentioned, are either its undue formation from some form of dyspepsia, or mal-alimentation, or its deficient excretion from the renal organs. Usually, these two causes are combined, sometimes one is more prominent, sometimes the other. Our treatment must accordingly vary. The undue formation of uric acid will be found to be especially influenced by diet and regimen, whereas the deficient excretion is more under the influence of remedies, and these remedies must be steadily, and perseveringly adhered to, and merely taken by the bye. Those remedies which seem best adapted for

for purifying the blood are such as increase the activity of the secreting organs, more especially, the kidneys, consequently alkalies and salines are peculiarly called for. Magnesia and Lime, as well as the fixed alkalies, have been largely used, and steady perseverance in their use appears in some cases to have warded off an attack for some time. The salts of Potash, the Bicarbonate, the Acetate, and the Citrate are most usually given, for in addition to their greater action upon the kidneys, they appear to have a greater solvent power for Uric acid than the corresponding salts of Soda. Many recommend small doses of salines, largely diluted with water, for patients suffering from chronic gout, but who present no active symptoms. They are best given before food, as they are then most readily absorbed. If otherwise administered they are more liable to produce dyspepsia. If the function of the skin is imperfectly performed, the salts of Ammonia are indicated. Dr. Buckler, of Baltimore and others have found the Phosphate most useful. Dr. Garrod speaks very highly of the salts of Lithia. It appears to be more active than the salts of Potash in dissolving gouty deposits from the cartilages. Their alkalizing power is of the highest order, their solvent power for uric acid and urates far greater than any other agent.

agent; their local influence is slight, and their use does not appear to be attended with any injurious consequences. The preparation which Dr. Garrod uses is the carbonate in the dose of from one to four grains two or three times daily. The great objection to their use is their expense. A decoction of the leaves of Fraxinus excelsior or common ash have attracted some notice in the treatment of gout. Dr. Pougnet & Peyraud considers it a specific, and M. Monchou speaks favourably of this preparation. Dr. Garrod found it of little benefit in the acute disease, but of considerable value in chronic gout. An ounce of the leaves is boiled for 10 or 15 minutes in Oij of water, and taken in divided doses during the day.

Tonic and Stomachic. If there is a want of tone in the stomach, bitter infusions are indicated, such as Chamomile, Chiretta, and Calumba, with small doses of Tincture of Capsicum to give a little increased stimulus, if necessary combine it with some alkaline salt, as the Bicarbonate of Potash. It is to be regretted of this class that the well known Portland powder owes its celebrity. The ancients were in the habit of using bitter tonics very analogous to the above. Systema gives a long list of plants which may be used for the same purpose. Preparations of Cinchona bark have

have been greatly lauded by some, while they
 have been as much denounced by others. Dr.
 Ranke states that Sulphate of Quinia diminishes
 the secretion of uric acid in the urine, and this
 diminution must depend either upon its lessening
 the formation of this acid, or checking its secretion.
 If the former should prove true, we should ex-
 pect quinine to be of essential service in gout, whereas
 if the latter should prove the true explanation, quinine
 and bark would be injurious. These observations have
 not been confirmed. - In those cases of gout where
 there is a great want of tone, along with anaemia, we
 should expect to find the careful exhibition of some
 preparation of iron to be of service, and that prepara-
 tion should be selected, which is least irritating to
 the stomach, such as the Ferrum Reductum, Saccharated
 Carbonate, or the Citrate. Ferruginous mineral waters, as
 those of Schwallbach, and Pyrmont would probably do good.

Local Treatment of Chronic Gout. False ideas of the
 composition of gouty concretions, at one time led to the pro-
 posal of acid lotions, but alkaline lotions were in much
 greater favour. Lotions containing the salts of Potash are
 most in favour, because we now know they possess a
 greater solvent power for Uric acid than the salts of Soda.

Sir G. Serravallo used to prescribe a solution of Potash,
 mixed

mixed with an equal quantity of recently prepared
Almond milk, and applied by means of friction,
 two or three times a day: In some cases of recent
 deposit, the concretion becomes gradually absorbed
 under this treatment. In cases of older standing, al-
 though much less could be accomplished, he ad-
 vised steady perseverance in this plan of treatment.
 For the edema of the extremities, which is not an
 uncommon sequela of gout, the hot air bath, friction
 with Camphorated oil, and elevation of the limb, are
 usually sufficient. If stiffening of any joint be
 the result of the fit, friction and passive motion
 should be cautiously tried. Gentle means, continued
 over a lengthened period, are more likely to be
 attended with success than the harsh use of mechanical
 Appliances. Douche baths, or the mineral waters of Vichy,
Viezbaden, and Buxton have been found useful.
 If it should be thought desirable to remove any of
 the small nodules which form on the ear, this may
 easily enough effected by puncturing them with a
 lancet, and squirting out their contents. On account of
 the little susceptibility of the ear to take on inflammatory
 action, such treatment is not followed by any injurious
 consequences. Now and then small tophi may be separated
 from other parts in a similar manner, but before doing
 so.

so, be careful to ascertain if they possess a deep origin. When concretions are formed around joints and project so as to be of much inconvenience, they may be punctured with a lancet, making only a small incision, and not using much subsequent prepulse. Occasionally, when incisions thus made do not heal, or when the tumours have burst of themselves, the sores become troublesome, and remain open for a long time. This obstinacy arises from the deposit of urate being deep seated. In some of these cases, the nitrate of silver seems of some service in restoring the healthy action.

Diet and Regimen in Chronic gout and Gouty habits. However valuable remedies are in Chronic gout, they are insufficient singlehanded, and need to be accompanied with great care as to diet. Moderation in meat and drink must be strictly attended to, in order that the stomach should receive no more food than it can easily digest. But the other extreme is equally injurious, for abstinence weakens the parts, by withholding from them their due proportion of that aliment which is necessary for supporting their vigour and strength. The rigid diet so necessary in the acute paroxysm, must be replaced by one capable of supporting the strength of

of the patient, but as all which exceeds this is productive of injury, there is no little difficulty in correctly apportioning it. Sir W. Temple says "Simple diet, limited by every mans experience to his own lacy digestion, and thereby proportioning as nearly as can be the daily repairs to the daily decay of our washing System". The use of all indigestible dishes, and especially all those which contain free acid must be cautiously avoided. An exclusively vegetable diet is said to have been sometimes successful. Sudden changes in diet are to be avoided as tending to bring on a Paroxysm. As regards animal food careful restriction of quantity is necessary, and this is perhaps best effected by making the number of dishes few, as mixtures of different meats are more difficult of digestion, than an equal quantity of any sort. The more digestible kinds of meat, as mutton, well kept beef and poultry, white kinds of fish may be partaken off, whereas salmon, veal and pork should be avoided, as also should salted meat and raw vegetables.

Potatoes, being valuable in giving certain constituents to the blood, may be freely partaken off. Of fruits, strawberries, grapes, oranges, and plums may be taken. Strawberrie, were said by Linnaeus to prevent attacks, when habitually taken. The time of taking food should be

be carefully regulated. Animal food should only be taken once in the day, and if in the middle of the day, an egg, or rasher of bacon may be allowed at breakfast, and late suppers must be carefully avoided. Wine and malt liquors should not be allowed. If alcohol in any form be required, a little weak, brandy, whiskey, or gin and water may be had recourse to. If from long habit, wine should be necessary to the proper performance of digestion, a little sound sherry is best. Port wine must be forbidden. Hock, Burgundy, and claret should be shunned, unless perchance they should agree better than sherry. The amount taken should always be moderate, but much depends upon the previous mode of life. Milk from its highly nutritive qualities and unstimulating nature, will prove very beneficial in many cases. Tea and coffee should be taken in moderation & not too strong. Exercise is most useful in chronic gout. "In respect to the kind of exercise," Sydenham remarks, "riding on horseback, unless forbidden by old age or a calculus, is by far the best." It should be moderate and regular. Foot and horse exercise are both good. Carriage exercise less so, but still of advantage when others cannot be employed. Friction may occasionally be substituted. The amount of Exercise must

must be carefully apportioned to the age and strength of the patient. Fresh air is of great advantage in certain cases, and change to a warmer climate is sometimes of use, especially in those cases, where the attacks are dependent on the state of the skin, and readily excited by the bleak east, and north-east winds. Upper Egypt and Malta are favorite places of resort for such sufferers. It is very necessary to attend to the cutaneous function, by wearing flannel next the skin, woolen stockings to keep the feet warm, and by taking warm baths occasionally. If an individual be subject to biennial or annual fits of gout, or even more frequent paroxysms, and the general health otherwise good, proper attention to diet and active and regular exercise, and sometimes small doses of colchicum and quinine will generally prevent an increasing frequency in the recurrence of the disease, and sometimes even prolong the intervals.

Many mineral waters have acquired great reputation in the treatment of gout. Some are undoubtedly very beneficial, whilst others have no action. Vichy water, consisting principally of Bicarbonate of Soda (contains about 40%) appears to be of most use

use in the complete intervals of acute gout, ^{occurring} in strong and robust subjects, when the disease depends rather on increased formation than defective elimination of uric acid, and in cases where the liver and digestive functions are considerably at fault. In many forms of chronic gout the baths appear useful, independent of any peculiarity in their constitution, but if taken internally, they are not suitable for the majority of gouty patients, as the salts of soda rather tend to diminish than to augment the solubility of urate of soda.

The waters of Carlsbad in Bohemia consist chiefly of sulphate of soda, but contain also the carbonate of soda, and the chloride of sodium in smaller quantities. They are purgative and diuretic, have some resemblance to the Vichy waters, and should be given under similar circumstances. The waters of Kissingen, Marienbad, Ems, and Cheltenham belong to the same class, and may be given under the same conditions.

The mineral waters of Wiesbaden (Kopau) contain the carbonate and sulphate of lime, the chloride of sodium, carbonic acid, and iron. Dr. Braum (Monographie des Eaux minerales de Wiesbaden) states

states as the result of his experiments that they increase the amount of uric acid and urea in the urine. They have been recommended as being most useful in those cases where the circulation is most sluggish, and the secretion deficient, and when there is much stiffness from previous attacks. The mineral springs of Aix-la-Chapelle, (Rhenish Pulpin,) contain Chloride of Sodium, and Carbonate of Soda, along with minute quantities of Sulphuretted Hydrogen. They ought to be given in similar cases as the waters of Wiesbaden.

The waters of Buxton, Bath, and Jozeplitz prove useful when employed for bathing purposes, - more from the action of the water than from any of the mineral constituents, as these are very insignificant. The ferruginous waters of Timbuck, Wells, Spa, Schwallbach and Pyrmont are useful when Anemia is found associated with gout.

not
true of
Buxton

On some irregular forms of Gout.

Before concluding this paper, I intend saying a few words upon this point. All, who have turned their attention to gout seem to agree that there are certain symptoms, and even many diseases which are greatly modified by the gouty habit.

Many people, even before they have a regular fit of gout, experience symptoms which may not improperly be classed under the above head. These symptoms commonly disappear on the occurrence of the paroxysm, but occasionally continue, although in a mitigated form during the progress of the articular inflammation; they are often present during the intervals of the joint affection, and occasionally occur in subjects who have never experienced a true fit, but are either hereditarily predisposed, or much exposed to the influence of its predisposing causes. When we can demonstrate that these symptoms depend upon the same diathesis, as that which leads to inflammation of the joints, we are certainly justified in referring them to a gouty state of the system, and considering them as forms of irregular gout. In endeavouring to distinguish the true nature of such anomalous symptoms, we must remember that our patients may be affected with both functional and organic diseases, not necessarily

gouty

gouty, although greatly influenced by the gouty condition of the system. Many of the most powerful predisposing causes tend to produce other forms of disease besides gout; and hence when these occur in gouty patients, they are not necessarily of a gouty character. The long continued existence of chronic gout leads to a depraved condition of the general nutrition of the body, and hence the slow production of many organic diseases.

But there can be no question that the same disposition which commonly leads to the development of regular gout, may produce symptoms apart from the joints, and which are essentially of a gouty character. Various names have been bestowed upon these irregular forms of gout, such for example, atomic gout, non-articular gout, podagra curvata, goutte vague. In determining the nature of any of these irregular forms of gout, we should in the first place see if he has got the physiognomical character of either of the two forms of the gouty diathesis before mentioned vide page et seq: & then enquire carefully into his history, to see if any hereditary predisposition exists, or if any active predisposing cause have been in operation, or if he has suffered from any previous affection of the joints. If you still be in doubt, examine the blood for urate.

Reprocedent

Retrocedent Gout is that form of Gout in which a sudden disappearance of the articular affection is followed by some serious mischief in one of the internal organs, as if a metastasis had taken place; and the organs usually attacked are the stomach, the heart, and the brain.

When the stomach is thus attacked, the symptoms indicating the transference of gout are ascertained to be an intense feeling of anxiety and oppression, often accompanied with spasmodic pain, and vomiting. Sydenham seems to have suffered from similar symptoms on the retrocession of gout from his limbs, and many cases of a similar nature are on record. Cold is one of the most frequent causes of such retrocession especially when accompanied by a heavy meal or indigestible articles of food. Are these gastric symptoms really due to gastric inflammation of the stomach? Many, perhaps most such cases may be explained by other means, as, e.g. exposure to cold, indigestible articles of food, are in some individuals sufficient to produce such symptoms, and when a patient is suffering from gouty inflammation of the extremities, it is probable that the system is predisposed

predisposed to take on inflammatory action. And although genuine gouty gastritis may in many cases occur, the majority of so called gouty inflammations of the stomach are merely ordinary forms of inflammation.

When the heart is seized with retrocedent gout, there is generally a feeling of constriction about the chest, violent palpitation, intense anxiety, difficulty of breathing, accompanied by a very small thready pulse, and a tendency to syncope. This may be explained under the notion of a spasmodic affection of the heart. Some authors have gone so far as to say that there is really a gouty inflammation of the heart, just as there is a rheumatic inflammation of the heart, and Dr. Bezie records some cases which he thinks are of this nature.

When retrocedent gout attacks the head, apoplexy is commonly induced, and may prove fatal. Death has been known to result in this way from plunging a gouty limb into cold water. Maniacal symptoms have occasionally been witnessed as the result of the retrocession of gout from the extremities to the head. The treatment in cases of retrocedent gout varies in each case. If the stomach

be

be affected, and there is no evidence of the existence of inflammation, stimulants, as ether, chloroform, ammonia and aromatics may be administered. If the pain be very intense, Opium may be tried. Vomiting should be promoted by diluents. Brandy is occasionally necessary. If there is any evidence of inflammation, Leeches, Hydrocyanic acid, & Bicarbonate of Potash are indicated. At the same time we should not neglect the Extremities for by the use of warmth, and counterirritation, we may frequently bring back the inflammation to these parts. When the heart is affected, the same remedies are indicated, at least at the commencement; and when the head is affected, similar treatment to that which would be adopted in the corresponding affections of other subjects, endeavouring at the same time to cause its return to the Extremities.

There are several symptoms referable to disorder of the digestive system, not unfrequently met with even in Patients who have never suffered from gout, but who strongly inherit it, or have sown the seeds of it by their mode of life. We frequently meet with such symptoms as are described as premonitory of a fit. Sometimes gastrodynia, pyrosis

and enterodynia occur. Constriction of the oesophagus or of the rectum have been met with in gouty patients, disappearing on the supervenience of a fit. Hemorrhoids from the congested portal system, and prurigo and probably also from the same cause sometimes occur as preliminary of a fit.

Gout attacking the heart is sometimes mentioned as giving rise to palpitation, often accompanied with irregularity of action. Angina pectoris occurs in gouty patients not infrequently. Arteritis occasionally occurs as a result of gout.

Cough and an asthmatic condition of the breathing are frequently produced by a gouty state of the system. Occasionally severe dyspnea is connected with the presence of latent gout, which may disappear on the supervenience of a regular fit. Asthma has been noticed to be very common in gouty families, and is probably often due to an impure condition of the blood.

Irritability of the bladder is not an uncommon affection in gouty people, and is sometimes accompanied by an increased discharge of mucus.

mucus, and generally with scanty and high-coloured urine, giving rise to a copious urate deposit on cooling. Sir C. Scudamore mentions some cases where there was a purulent discharge from the urethra relieved by the occurrence of gout in the feet.

The kidneys appear occasionally to be attacked with gout, and some authors affirm that true gouty inflammation is sometimes set up in the structure of the kidney, accompanied with deposits of urate of soda, not merely in the tubuli uriniferi, but in the fibrous tissue itself, and the frequency with which this takes place is shown by the almost constant occurrence of such deposits in the kidneys of gouty patients when examined after death.

The prostate gland and testicles have sometimes appeared to be attacked by gouty inflammation, and relieved by the occurrence of gout in the extremities.

Gout of the eye. A form of ophthalmia connected with gout has long been recognised. Conjunctivitis, sclerobitis, and iritis are also undoubtedly sometimes gouty.

Gout of the ear. The small nodules on the ear have

have already claimed our attention. Their formation is sometimes scarcely noticed, but in others their deposition is accompanied by phenomena exactly the same as when a joint is affected, commencing with infiltration of tissue, afterwards followed by inflammation, the difference depending mainly on the amount of inflammatory action. Mr. Forster has pointed out the occurrence of deposits on the tympanum of gouty patients.

Gout affecting the skin. Psoriasis was noticed by Sir W. Ross as being prevalent in gouty families - sometimes alternating with acute attacks of the disease, sometimes suspended by them, sometimes seeming to prevent them in individuals thus disposed. Eczema has also been noticed in gouty people, and Furunculosis is not uncommon.

Gout affecting the nervous and muscular systems. The symptoms are usually functional but sometimes dependent on inflammatory action. ^{Cramp is not uncommon} both as premonitory of a fit, and also in the interstices.

Allied to this is a very singular affection noticed by Dr. Graves, which consists in an insuperable desire on the part of the patient to grind his teeth, apparently originating in the teeth themselves, and momentarily alleviated by forcibly grinding them together, but immediately returning when the patient ceases

ceases to perform this action. It ceases during sleep, the grinding being in all cases the result of voluntary motion. In confirmed cases the teeth are ground down to the level of the gums. By noticing this affection to occur in people of the gouty diathesis, he is inclined to attribute its occurrence to the effect of the poison afforded on the dental nerves. Neuralgia, as a manifestation of gout may occur in various situations. It is difficult to diagnose unless alternating with joint disease.

Van Swieten mentions that Epilepsy sometimes occurs in a regular paroxysm, & then ceases. The spinal cord is said sometimes to be affected giving rise to great depression, pain, & hyperaesthesia &c.

Treatment of irregular gout must necessarily differ greatly in different cases. When any important internal viscus is affected, it would be our endeavour to induce gouty inflammation of the extremities, which is best accomplished by warmth, moderate counterirritation, a hot bath, mustard poultices &c. Aim at correcting the gouty diathesis by adopting similar measures to those used in chronic gout. Colchicum is of use even in the most irregular forms of the disease. A case of gouty bronchitis was treated in the clinical wards of the Infirmary this winter by colchicum, and recovered in an incredibly short space of time.