The Uric Acid Diathesis

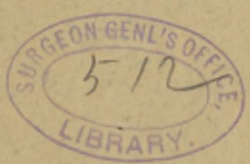
AND

Its Treatment.

By JOHN F. BARBOUR, M.A., M.D.,

Neurologist to the Louisville City Hospital.

Reprint from THE AMERICAN THERAPIST, June, 1894.



301
69
232

140
92
69
301

THE URIC ACID DIATHESIS
AND
Its Treatment.

By JOHN F. BARBOUR, M.A., M.D.,
Neurologist to the Louisville City Hospital.

Reprint from THE AMERICAN THERAPIST, June, 1894.

Uric acid has now come to be regarded as one of the great poisons, fully comparable in its evil effects upon the human body to syphilis and tuberculosis, but far more insidious and slower in its action than either of these.

A few words first as to the chemistry of the subject. The acid radical of uric acid is bibasic; it forms, therefore, two series of salts, the acid urates and the neutral or simple urates. There exists also, as was first pointed out by Sir W. Roberts, a third salt, the quadri-urate.

Free uric acid is found in urinary sediment, in gravel and calculi. The neutral urates and biurates do not occur physiologically. The quadri-urate is found in the normal urine and is held in solution, owing to the temperature of the urine within the body and the presence of potassium salts. When it is not held in solution in the bodily fluids but is deposited, it gives rise to a long chapter of symptoms which we shall presently consider.

In what part of the system is this poison generated? The investigations of Chittenden, of Yale (*Dietetic and Hygienic Gazette*, Febr. 1894), Horbaczewski and others have thrown a flood of light upon this interesting problem. According to these writers, uric acid is a nuclein product and is formed in the following way: All animal cells are made up largely of proteid bodies known as nucleo-albumins, which are phosphorized albuminous bodies. Nuclein is the substance constituting the cell nucleus in all animal cells. It yields a series of decomposition products, called the xanthin bases, which belong to the uric acid group. These bases find their origin in the nucleic acid of the cell nuclei, showing that there is a close relation existing between the chemical changes going on in the cell-nuclei and the development of uric acid. This will be made plain by comparing the chemical formulae of two of these bases, xanthin and hypoxanthin, with that of uric acid:

Hypoxanthin	$C_5H_4N_4O$
Xanthin	$C_5H_4N_4O_2$
Uric Acid.....	$C_5H_4N_4O_3$

Every organ in the body yields uric acid when properly treated, although in different proportions.

The following table, compiled by Chittenden, is constructed from results obtained by Sadowery and Formanek under Horbaczewski's guidance:

MILLIGRAMS OF URIC ACID OBTAINED FROM 100 GRAMS OF TISSUE.

Liver, calf.....	60
" human	65
Lung, calf.....	74
" human.....	44
Intestines, mucous membrane, calf.....	84
Bone marrow, calf	40
Pancreas, calf.....	12
Tendons, calf.....	4
Muscles, calf.....	8
Thymus, calf	48
Stomach, mucous membrane, calf	22
Kidney, human.....	18
Skin, human.....	45
Brain, human.	28
Pus, human.....	20
Salivary gland, calf	25
Cartilage, calf	15
Neckband, calf.....	14

Pawlinoff found, after ligating the ureters in birds, that the deposits of uric acid were about the cell nuclei.

A relation has also been shown to exist between the rapid development of leuco-

cytes following the ingestion of albuminous food—the so-called digestive leucocytosis—and the production of uric acid; the latter arising from the breaking down of the newly formed leucocytes. In those diseases which are attended by breaking down of the tissues, in the fevers, pneumonia, leukemia, etc., there is increased elimination of uric acid.

Levison, of Copenhagen, in his recent monograph on this subject, *Die Harnsäurediathese*, announces the following conclusions:

1. Uric acid is formed by the decomposition of the albuminous substances of the tissues and especially of the nuclein or nucleins.

2. The excretion of uric acid is increased or diminished by all those factors (diseases, medicines, poisons, etc.) which produce a quicker or slower destruction of the cellular elements of the body, especially of the leucocytes.

3. Ingestion of food, especially of meat, brings about a transitory digestive leucocytosis which is evidently called forth by the nuclein introduced in the food.

4. The amount of uric acid eliminated in twenty-four hours is not affected to any great extent by the diet. There is only this difference that the easily digestible animal albumins produce digestive leucocytosis as well as the formation of uric acid much more speedily than do the vegetable albumins which are difficult of digestion.

When we consider the development of arthritis uratica, evidently there are only two hypotheses possible—either there is an increased production, or a decreased elimination of uric acid by the kidneys. Nearly all the authorities on this subject —Garrod, Roberts, and more recently Pfeiffer and Levison—maintain the latter view. This finds strong support in the fact that in leukemia, where the production of uric acid is very great, as much as 3 to 4 grams a day being eliminated in the urine, arthritis does not occur so long as the function of the kidneys remains normal. Ferguson, of Toronto, Canada, estimated the daily normal output of urea at 363 grains. The investigations of Berlioz, Lecanu, Duckworth, Garrod, Haig, Haycraft, Landois, Heidenhain and Ferguson show that the formation (not the elimination) of uric acid is in the ratio of one to thirty-three of urea. This makes the average daily normal output of uric acid eleven grains. Where the ratio is different it shows either on the one hand that some of the uric acid is being retained in the system, or, on the other hand, that it is being eliminated in excess of its formation, and this excess must come from what has previously been stored up in the body.

When the elimination is deficient, if the blood be rendered acid by the drinking of acid wines or beer, the uric acid is deposited in the form of the biurate. If, on the other hand, the blood be rendered alkaline by a vegetable diet, by the use of mineral waters, or by exposure to wet and cold, these deposits are taken up in the circulation again with the effect of producing severe mental depression, violent headache, and all the symptoms of a uric acid storm.

In a serum rich in sodium salts the crystals of the biurate will form with unusual rapidity. The synovial fluid is especially rich in these salts (0.80%) which serves to explain the occurrence of arthritic phenomena. Moreover, this fluid is contained in cavities where it is little liable to movement or change. That a sedentary mode of life, without bodily exercise, predisposes to arthritis is to be explained, perhaps, by the fact that the synovial fluid in the little used joints becomes more watery, poorer in albumin and richer in sodium salts.

It is not our purpose to enter into a discussion of the innumerable symptoms produced by the retention of uric acid in the system. A long time ago Sir Thomas Watson wrote: "Gouty persons are subject to various ailments which spring from the same fountain as the well-marked paroxysm—derangements of the digestive

organs, of the heart and lungs, of the brain and nerves. They often disappear on the breaking out of that disease in the foot." Certainly in this country the typical, normal, acute, true attacks of gout are rare; owing doubtless to the peculiarities of our climate and mode of life, we find far oftener what the writers describe as irregular, anomalous, latent, chronic, atonic, internal, misplaced, atypical and suppressed gout. Especially rare are the classical attacks of gout in American women, although they show frequent signs of an inherited uric acid diathesis in the form of obstinate neuralgias, acid dyspepsia, and what an old friend of ours used to call "lazy livers."

Hardly an organ in the body escapes the influence of this potent poison. Of especial interest are its effects upon the kidneys, the blood-vessels and the nervous system.

Horatio C. Wood, in a lecture entitled "Chronic Contracted Kidney: The Mystery of Its Development, and the Secret of Its Prevention" (*University Medical Magazine*, June 1893) has this to say:

"The second proposition which I desire you to remember in connection with that just enunciated is that poisons formed within the body are capable of acting upon the kidneys precisely in the same manner as do poisons which come from without, and that lithic acid, oxalic acid and probably ptomaines and other organic substances originating in the human system may produce not only albuminuria but also tube-casts. I believe that could we know the life history of cases of contracted kidney whose nature we perchance only recognize when the mischief is too far gone to be undone, it would be found that over and over again in these unfortunate persons, perhaps as the result of a debauch, perhaps as the outcome of an oxaluria, perhaps as the product of a lithemia, perhaps as the work of a poison from without the body, there has been a long series of renal irritations, paroxysms of subacute albuminuria, each one passing away sooner or later, but leaving behind it a minute scar on the structure of the kidneys, and scar upon scar accumulating until at last the whole renal structure has been destroyed."

In 1866, Charcot and Bouchard showed that cerebral apoplexy is caused by the rupture of a miliary aneurism in the brain. These aneurisms result from an arteriosclerosis affecting the cerebral arterioles; and one of the commonest causes for this disease of the blood-vessels is the presence of an excess of uric acid in the blood. It has long been known that gouty subjects are especially obnoxious to cerebral hemorrhage, though no satisfactory explanation could be given to account for this fact. Apoplexy is of course a disease of the blood-vessels and not of the brain, although it is usually classed among the nervous diseases, on account of the symptoms.

Far more important and interesting are the injurious influences of uric acid upon the nervous system, which have been admirably worked out by the French school. Charcot was the first to point out the family relations existing between certain diseases. He makes use of this comparison: "One may consider the uric acid diathesis as forming a tree, the principal branches of which are the gout, articular rheumatism, certain forms of migraine and of cutaneous affections, etc. On the other hand, there is a nervous tree comprising neurasthenia, hysteria, epilepsy, all the hereditary forms of insanity, general paresis, locomotor ataxia, etc. These two trees spring as it were from the same soil, they communicate by their roots, they are so intimately related that one is tempted at times to ask if they are not one tree."

"With this key," M. Charcot continues, "one can comprehend most of the phenomena which present themselves in nervous diseases, and which are incomprehensible without it. When a patient affected with a neuropathy comes under observation, he should be considered as merely an episode of the disease."

M. Bouchard, in his studies of what he calls "diseases of slowed nutrition," arrives at analogous conclusions. The insufficient elaboration of substances in the interior of the cell allows of the accumulation, in the

tissues or in the humors of the body, of substances which normally would be metamorphosed; on the other hand, under these same conditions, the nutrition of the cells being imperfect, they functionate abnormally. Under the first head belong obesity, diabetes, and gout; under the second head are included migraine, asthma, the neuroses; and in these last, one is forced to admit a modification in the functioning of the nervous elements. These diseases of slowed nutrition, which are nearly all hereditary, constitute the group of arthritic affections.

It is frequently observed that those who present distinctly the disturbance of nutrition which leads to these diseases, beget neuropathic, hysterical, choreic, migrainous, asthmatic, neuralgic subjects, and those affected with headache during their adolescence. Hypochondria, epilepsy, and mental alienation may also be met with under these circumstances, according to M. Bouchard.

"In the gout," says M. Déjerine, "nervous disturbances of every sort are very common; they occupy a large place in the symptomatology of this affection, and may affect the intelligence, the motility, the general and special sensation. M. Charcot has remarked that in connection with gout, one may encounter disturbances analogous to cerebral rheumatism, acute delirium, insanity and headache."

M. André, of Toulouse, has seen in his practice the children of gouty parents present various nervous affections, hypochondria, neurasthenia, headache, hysteriform disturbances, etc. A man living near Toulouse, gouty and asthmatic, had three children, the oldest of whom died of general paresis at the age of 44, the youngest perished in an insane asylum at the same age, and the second, who is extremely gouty, has been of a violent and vicious disposition all his life.

M. Dieulafoy has shown that cerebral hemorrhage is frequently hereditary. But what constitutes the heredity in these cases is the vascular lesion, which is due to gout. The gastralgias, migraine, asthma, epilepsy, the tics, paralysis agitans, have been noticed in gouty subjects.

Dr. Ménélac Sakorrhaphos, of Athens, has contributed to *Le Progrès Médical*, for Oct. 21, 1893, a masterly article upon this topic, which is characterized by great breadth of generalization and power of clinical analysis. We quote from him at length (original translation):

We have continued to examine patients exhibiting the clinical tableau of arthritism (and they are by no means rare!), and the surprise we have experienced at finding arthritic maladies in combination with nervous affections, has led us to believe that these two diatheses differ in no respect from one another. Aside from the combination of these two diatheses in the same individual or in the same family, the close relationship between these two morbid states, the etiology, the slow march, certain of the clinical tableaux which are encountered, are evidently the same.....

Certainly when one sees hysteria combined with tuberculosis, tabes with diabetes or some other arthritic malady, when science proves the relation of gout to the different neuroses and psychoses; when one observes the arthritic nature of most of those nervous diseases whose slow and progressive march, unless interrupted by causes which we shall examine, inevitably ends in the major neuroses or psychoses; when he observes finally that these two diatheses have a common etiology, and that sclerosis of the viscera is identical in character with the systematic scleroses found in the nervous system, he will no longer see any reason for considering these two morbid conditions as separate and distinct.

Some observers, embarrassed by the plain sight of these two morbid states, arthritism on the one hand and the nervous diathesis on the other, marching side by side in the same family, have endeavored to define a third pathological state, calling it neuro-arthritism.....

But we would observe, in the first place, that the arthritic subject is always a neuropath from the beginning to the end of his disease; however, the grave nervous phenomena only present themselves during the period of the full development of the arthritic diathesis, that is to say at the time when the major disturbances of nutrition appear. This is the reason, in our opinion, why diabetes, the gout and other affections of the same category, are so often found associated with grave nerv-

ous diseases. But do not the very symptoms which characterize the first period of arthritism, such as localized spasms, general convulsions, pruritus, urticaria, spasmodic cough, nocturnal incontinence of the urine, and many other morbid conditions, indicate sufficiently clearly that the patient's nervous sytem is mainly at fault, as is manifested by the sensory and vasomotor disturbances? Moreover, are not the same disorders found in the psychical sphere! If you will take a little child, the issue of arthritic parents and inheriting the vice of constitution, you will find that these little creatures, wrongly considered by some writers as hysterical, will laugh or cry or fall into a rage over matters which would not so affect healthy children. Their power of attention is defective, they are distraught.....

The nervous diathesis is, in our opinion, merely the continuation of arthritism and represents its period of decline.

We divide the march of arthritism into three great periods.

A.—*Period of dynamic disturbances.*—This is characterized by various phenomena which are mild and fugacious from a clinical point of view, and leaving no perceptible pathological change (localized spasms, general convulsions, spasmodic cough, incontinence of urine, mild psychical disturbances, etc.).

B.—*Period of profound disturbances of nutrition.*—This period includes all those diseases, described by Professor Bouchard, under the name of the diseases of slowed nutrition; moreover, arterio-sclerosis being a grave disturbance of nutrition ought to be classed under this category.

C.—*Period of individual degeneration.* (Hysteria, epilepsy, dementia, and other psychoses.)—It is especially during this period, that purely nervous diseases are encountered. The march of arthritism is slow and progressive; it results after long years in the so-called nervous diathesis. As the life time of one individual is not sufficient for the evolution of this disease, it is transmitted by heredity. We relate briefly a few of the many clinical facts which we have been able to collect.

Observation I.—Three generations. The grandfather was bald, rheumatic, affected with hemorrhoids and arterio-sclerosis. Grandmother obese. Two children were born of this union, one of them, aged 55, is tabetic; the other, aged 45, is hemiplegic as the result of a cerebral hemorrhage. The first had epistaxis and migraine during his youth. About the age of 25, he became bald. About 40, the first symptoms of tabes appeared. He has never had syphilis. At present he is completely paralyzed. The temporal artery is tortuous and hard, as is also the radial. The pulse is intermittent. He married a healthy woman, but had no children. The other brother, the hemiplegic, married and had a child, at present 18 years old, who had convulsions during his infancy. At present he is epileptic and his intelligence is very defective.

Observation II.—Three generations.—No accurate information concerning the grandfather. The grandmother had migraine and hemorrhoids. At 30, she was obese and had a transient glycosuria. At 40, she had an epithelioma of the breast and was operated on by Nélaton. She died of uremia. She had two children, one of whom died at the age of 50. He had migraine during his youth, was given to speculating, very ambitious, etc. At the age of 40, he was affected with generalized arterio-sclerosis, with localization in the kidneys and heart; he died from an attack of asystolia. Having married a woman who was obese and had tic convulsif, he had a daughter who had repeated convulsions during her infancy, and who is now, at the age of 20, hysterical. (Hysterical crises, retraction of the visual field, absence of the pharyngeal reflex, hysterogenous points).....

If an alliance is made between two people with an equally marked hereditary vice of constitution, this union will give birth to a being who will inherit the same affection as his parents, or, and this is the rule, a pathological condition more pronounced than that of his parents.....

Professor Dieulafoy has mentioned the influence of heredity upon the production of cerebral hemorrhage. Moreover, he has observed that the descendant may be affected by the disease at a much earlier age than his parents. This ingenious observation indicates clearly that a new generation of arthritic origin has much less power of resistance to pathological influences, and that the vitality of the cells which compose the organism, is enfeebled by the inherited constitutional vice.....

One can follow the gradual course of the arthritic diathesis and see its termination in the nervous diathesis in the israelitish race. The Jews, who intermarry on account of their religion, are nearly all arthritics. The gout, diabetes, organic nervous diseases, the neuroses and psychoses, are common amongst them.....

Hygienic measures adopted in good time may arrest the fatal march of the disease. The question of environment is then of great importance.....

One may say, arthritism—and under this name we include the nervous diathesis likewise—represents as it were the human race in its period of decadence; it is a sign of the approaching end of a family, precisely as an acute disease destroys the life of an individual.

Arthritism is nothing more nor less than a chronic and permanent deviation from the normal type of nutrition. The whole organism is upset by this perturbation, which at the beginning, at least, is not powerful enough to destroy the life of one individual. Little by little the organism accustoms itself to this *modus vivendi*, the cells which compose it, and among them the spermatozoa and the ovules, become altered, and this alteration remaining for a long time in the organism becomes a habit, a mode of being, and as such is transmitted by heredity. Moreover, arthritism being a disease of the nervous system is especially apt to be hereditary.

Equally as striking and radical are the views of Dr. Vigouroux, as expressed in his brilliant monograph, "*Neurasthénie et Arthritism.*" He says (our translation):

Neurasthenic patients are arthritics. The proposition is not new....; but up to the present time it has rested upon clinical, that is to say, debatable, considerations. M. Huchard was the first to announce, ten years ago, the relation between neurasthenia and arthritism. In the *Traité des Nevroses* (by Axenfeld and Huchard) he attributed to rheumatism certain nervous manifestations, and penned the following phrase, reproduced in the recent edition of his treatise on diseases of the heart: '*In most cases neurasthenia is an arthritic neurosis.*' He does not seem, however, to have followed out the therapeutic consequences resulting from this comparison. In his chapter on neurasthenia, he pays no attention to the regime, and the only anti-arthritic medication which he recommends is the prolonged administration of small doses of salicylate of soda. He adds that one should treat the diathesis, which is most frequently arthritic, and sometimes herpetic. In the *Traité des Maladies du Coeur* there are numerous passages which show that he admits the gastric origin of neurasthenia.

We repeat then, neurasthenic patients are arthritic. Granting this, two question present themselves. In the first place, is it necessary to preserve the reserve shown by M. Huchard, and simply to say, most neurasthenic patients? Our analyses of the urine allow of no hesitation in answering this question. *All neurasthenic patients, without exception, are arthritics.....*

There is no distinction to be made between those affected with simple neurasthenia and the neuro-arthritics. The word 'neurasthenia' of itself implies the idea of arthritism.

In the second place, to what extent can the remarkable anomalies of the urine in neurasthenia explain its pathogenisis? ....

The sole characteristic of the urine of neurasthenia is that it is very plainly an arthritic urine. The analyses given are identical with those of arthritism in general, when there is no neurosis present.

The two principal facts revealed by biological chemistry are, that in neurasthenia there is hyperacidity, and that it entails all the consequences of insufficient disassimilation. One can apply accurately to neurasthenic patients Bouchard's observations concerning arthritics, which he sums up in the following propositions:

The nutrition is retarded:

1. When, after the ingestion of a certain amount of food, the organism requires a considerably longer time to return to its original weight than is required in the normal state.
2. When the amount of food necessary to support life—the living ration—is below the normal.
3. When the weight of the body increases under the normal amount of food.
4. When, under the living ration, the amount of excreta is less than normal.
5. When, during abstinence, the diminution in the bodily weight is less than normal.
6. When, during abstinence, the amount of excreta is less than normal.
7. When there appear in the excreta incompletely elaborated products, uric acid, oxalic acid, the other organic acids, the volatile fatty acids.
8. When one or more of the proximate principles accumulate in the body, the alimentation remaining otherwise normal.
9. When there is a greater lowering of the temperature during repose and abstinence, and particularly during sleep, than is found in the normal state. (Bouchard. *Maladies par Ralentissement de la Nutrition.*)

These propositions concerning the weight are only true when there exist no gastric or hepatic complications. When these are present, the living ration and even super-alimentation will not cause an augmentation of weight, quite the reverse.

The hypothermia is evidently the result of diminished oxidation. In neurasthenic patients this result may have a pathogenic influence. Thus the insufficient production of heat brings about compensatory processes which tend to diminish the loss of heat by radiation. Such are the vascular spasms which render the integument anemic and give rise to cutaneous anesthesias or to sensation of cold.

The one conclusion to be drawn from these facts is, that arthritism is a necessary condition to the development of neurasthenia.

On the other hand, Rockwell is of the opinion that lithemia is never productive of genuine neurasthenia. In his preface to the last edition of Beard's work on neurasthenia, he says: "The nervous system is strong enough, and would give no trouble if it were not poisoned by the abnormal products of digestion that enter the blood and circulate freely through every tissue of the body." He admits the occurrence of a combined type of the disease, which he calls "neurasthenic lithemia."

In discussing the differential diagnosis between these two conditions, he lays stress upon the character of the mental phenomena, of the circulation, the tongue, and the pulse.

"Both the lithemic and neurasthenic suffer from mental depression and a profound sense of misery, more marked, indeed, in the former than in the latter condition. While, however, the neurasthenic may suffer from the deepest melancholy, and imagine himself heir to a thousand ills, he becomes the victim, as a rule, of no such irritability and unreasonable outbursts of temper as the man whose brain is actually poisoned by the imperfectly transformed products of digestion.

"In neurasthenia, again, cold hands and feet are not by any means the rule, but in intestinal and liver derangements the nitrogenized wastes circulating in the blood cause, by their irritation, tonic spasm of the arterioles, resulting in the cold hands and feet so bitterly complained of by the sufferer from lithemia. The condition of the tongue is an important diagnostic aid. In lithemia it is coated far more frequently and to a greater extent than in neurasthenia, but in some cases of lithemia the tongue is but slightly affected. It may appear at first sight perfectly normal, and it is only when looked at carefully from the side that an unnatural brownish color is observed. As regards the pulse, it may be said that in lithemia it is slow rather than fast, and in neurasthenia fast rather than slow."

It must be said that Rockwell's conception of lithemia is much narrower than Vigouroux's, since he seems to limit it to intestinal and hepatic derangements. These remarks were written some years ago, before the pathogenisis of lithemia was fully understood. No doubt, also, lithemia is more common in France than in America, owing to intermarriage and the universal use of alcohol.

Treatment.

The treatment naturally divides itself into two divisions: the treatment of the acute attack, and the treatment of the diathesis.

Piperazin-Schering seems to give the speediest results in the acute attacks, as the following cases will show:

Case I.—W. B., a minister, aged 55, of strongly marked uric acid diathesis. Both his father and his grandfather gave unmistakable signs of the same diathesis. He has been subject for years to uric acid storms which are attended with severe sciatica, gridle sensation, burning spots in the limbs, high-colored urine, aching in the loins, injected conjunctivæ, headache, insomnia, pain and sense of fullness in the occipital region, etc. Usually one of these attacks confined him to the house for two or three weeks. He was accustomed to take a mixture of colchicum and iodide of potassium. Under the use of piperazin his urine cleared up in 48 hours and he experienced great relief. The remedy was continued for some time, with the idea of eliminating the uric acid stored up in his system. Several times since he has had threatenings of an attack, which

have always yielded promptly to the piperazin-Schering, 15 grains daily in copious draughts of water.

Case II.—D. C., aged 28. His father was obese and suffered for years from the asthma; his mother has tophi and other unmistakable evidences of gout. The patient has a "lazy liver". When he first came under my care he would have every three or four weeks an attack characterized by headache, fever, pains in the limbs, nausea, vomiting, general malaise, high-colored urine, vertigo, insomnia, anorexia, tinnitus aurium, muscæ volitantes, etc. Under a restricted diet and systematic exercise, these attacks nearly disappeared. I was called to see him in one of them recently, when it occurred to me to try the effect of piperazin. It relieved him much quicker than anything else he had ever taken, reducing the attack to one-third or one-fourth its customary duration.

Case III.—O. W., a clannish family in which there had been a number of intermarriages, which had served to intensify the prevailing uric acid diathesis of the race. He had been for years a terrible sufferer from insomnia and depression of spirits. Every few weeks he would have an attack accompanied by pains in the calves of the legs, high-colored urine, chilliness, coldness of the extremities, and intensification of his mental symptoms. After trying various remedies, and among them salycilate of soda, which some have lauded in such conditions, I finally prescribed piperazin-Schering, with excellent effect. It promptly relieved the pain and gave him what he called a "very restful feeling." Under a vegetable diet, exercise and hydrotherapy, he improved greatly.

215 W. Chestnut St., Louisville, Ky.

Treatment of the Diathesis.

This is entirely hygienic and dietetic. These patients should keep perpetual lent.

They are like a smoky flue; everything must be done to increase the draught.

The indications may be summarized as follows:

A non-nitrogenous diet.

Abundant exercise in the open air.

The free use of water both internally and externally.

To each tumbler of drinking water should be added a little concentrated solution of piperazin (15 grains of the drug, dissolved in 1 ounce of water, to be used up each day); this gradually eliminates excess of uric acid, and aborts further diathesis.

The . .

American Therapist.

A MONTHLY RECORD
OF
MODERN THERAPEUTICS, WITH PRACTICAL SUGGESTIONS RELATING TO THE CLINICAL APPLICATIONS OF DRUGS.

JOHN AULDE, M. D., - - Editor.
1411 Walnut Street, Philadelphia, Pa.

Subscription Price, $1.00 per annum.

PUBLICATION OFFICE:
25 BEEKMAN ST., NEW YORK.

ADDRESS ALL COMMUNICATIONS TO
The American Therapist,
P. O. Box 1170,
NEW YORK CITY.