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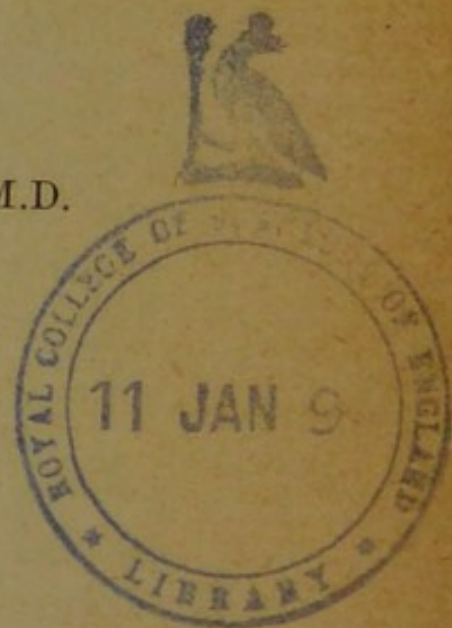
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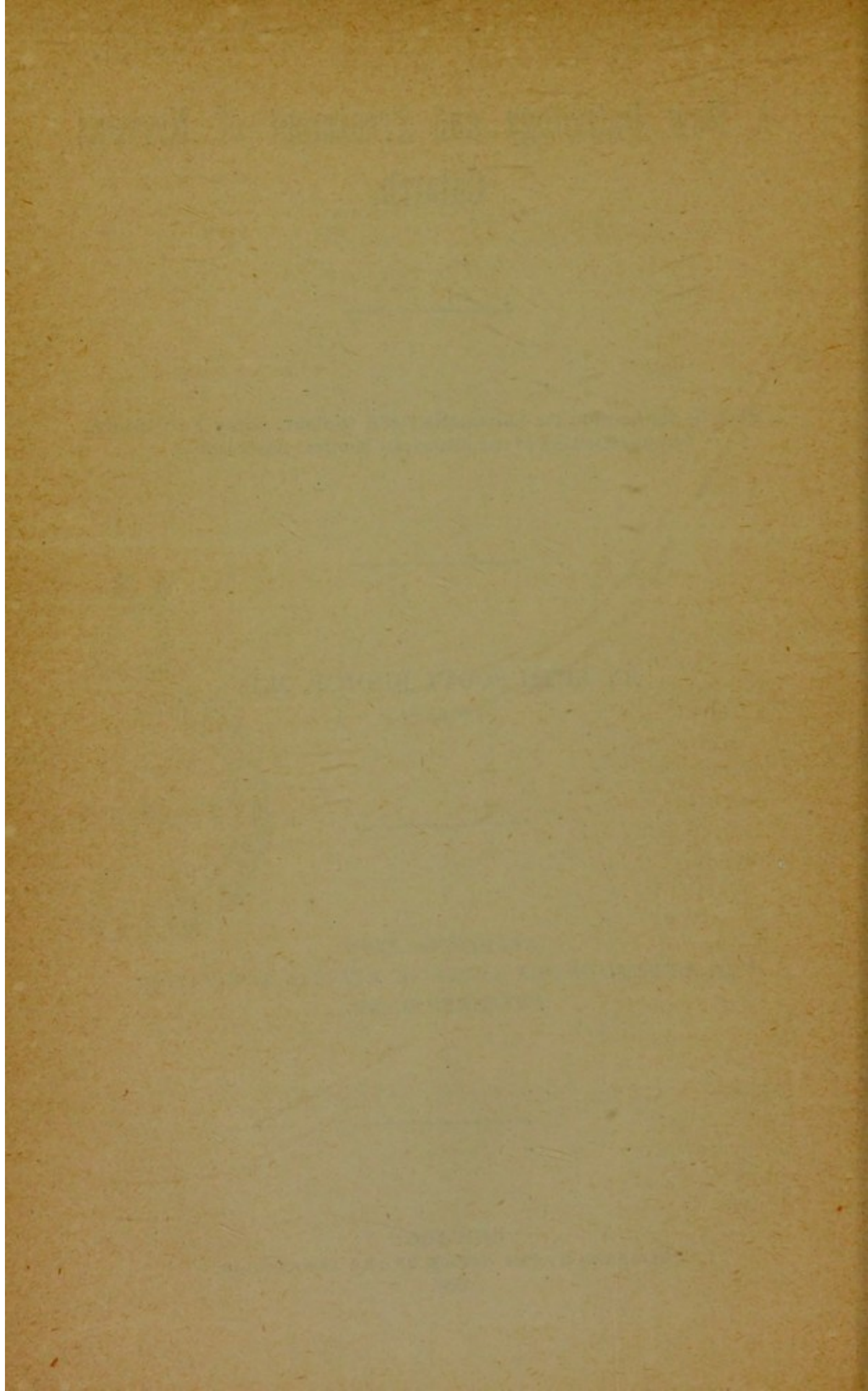
Read in the Section on Laryngology and Otology, at the Forty-fourth
Annual Meeting of the American Medical Association.

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A NEW PATHOLOGY AND TREATMENT OF NERVOUS CATARRH.

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An excess of uric acid in the blood causes nervous catarrh (hay fever). Attacks can be stopped, by precipitating the excess of uric acid from the blood by rendering the latter less alkaline with an acid treatment. Attacks can be prevented, by reducing the amount of uric acid in the body to the normal, and maintaining it there.

Uric acid exists in the blood in the proportion of about 1 to 33 of urea in health. When this proportion is disturbed by a relative increase of the uric acid, certain disturbances of a vascular and neurotic character arise. The effects of uric acid in producing these disturbances have been the subject of an extensive and interesting series of experiments by Alexander Haig. For years he was a sufferer from migraine, and studied in his own person the relation of uric acid to the production of attacks of this disease, and the effects of anti-uric acid treatment in subduing attacks, and of diet in preventing them. I desire at the outset to acknowledge my great indebtedness to this painstaking observer for many of the facts adduced in this paper.

First, let us consider what the effects of an excess of uric acid in the blood are. The disorders of the nervous system, that Murchison associated with lithemia are: aching pains in the limbs, and lassitude; pain in the shoulder; hepatic neuralgia; severe cramps in legs; headache; vertigo and temporary dimness of vision; convulsions; paralysis; noises in ears; sleeplessness; depression of spirits; irritability of temper; cerebral symptoms and typhoid state.

Haig maintains that the presence of uric acid in excess accounts for the exacerbation of pains in rheumatism and gout, and Lever contends that these diseases are primarily due to the action of this acid on the brain, the spinal cord, or the solar plexus of nerves. In persons suffering from intense pruritus, uric acid and the urates have been found in excess.

Ebstein believes that uric acid deposition acts as an excitor of inflammation in the tissues in which it is deposited.

Quinquaud studied the effects of uric acid on the skin. He administered three to six grains a day to the human subject. The most common results were boils, and patches resembling eczema, the dermal analogue of coryza.

Thomas J. Mays attributes attacks of angina pectoris to "the increased formation of uric acid, which is incidental to the gouty and rheumatic diathesis." He agrees with Haig in attributing migraine to the irritating effects of uric acid.

Conklin details a number of well-marked cases of nervous, mental, nephritic and other diseases, that support the proposition that they are the result of the action of uric acid.

N. S. Davis, and others, add the following to the list of manifestations of uricacidemia: loss of appetite; nausea and vomiting; flatulent indigestion; diarrhea; intense itching; asthma; blindness; deafness; numbness of the skin, and creeping sensations; hyperesthesia and pain in the skin; impaired memory; melancholia; delirium; epilepsy and coma.

Observe the symptoms of uric acid irritation that are closely allied to paroxysms of nervous catarrh: asthma; intense itching; over-sensitiveness, and other nervous disturbances of the skin; neuralgia; sick headache; irritability of temper, etc. The first three symptoms often characterize attacks of nervous catarrh, and highly moral persons, like the late Henry Ward Beecher, are seized with an almost irre-

sistible impulse to accompany their storms of sneezing with a shower of profanity. Sick headache sometimes alternates with these attacks, and at other times takes the place of them.

While suffering from migraine, Haig found the uric acid increased to the proportion of 1 in 20 or 25 of urea, whereas before and after attacks he found it as 1 to 40, and the headache was proportioned to the excess of uric acid over the urea, and not to the amount of alkali used to bring the uric acid out. The mental condition varied directly with the relative amount of uric acid in the urine. The excretion of the acid was greatly diminished before the attacks, i. e., during mental exaltation.

I have learned while writing this paper, that Leflaive analyzed the urine before and during attacks of hay fever, and found uric acid in great quantity just before the attack, and half that quantity during the attack. Some of this may have been washed out of the system through the profuse perspiration that occurs during the violent sneezing.

Haig says: "Uric acid in the blood contracts the arterioles and capillaries all over the body, producing the cold surface and extremities, raising tension of pulse and, according to Marcy's law, that pulse rate varies inversely as the arterial tension, slowing the heart. Headache is a local vascular effect of the uric acid. Excretion of this acid may even explain the mental depression and irritability, and their results in the excess of suicides and murders in July. There is an excessive excretion of this acid in the warm months, and a minus excretion in cold weather. During plus excretion there will be high arterial tension with anemia of the brain, bad temper, etc. At this time a dose of acid would free the brain circulation from the power of the uric acid and produce, as Roy and Sherrington have shown, an increase in its size, and a free flow of blood in its vessels."

Peiper says that alkalescence of the blood is dimin-

ished in all fevers. Corroborative of this, Haig found during an attack of influenza in 1890, that there was a rise in the acidity of his blood, urine and tissue fluids, thus driving the uric acid out of these fluids, diminishing its excretion and causing its retention in the body.

Bertillon says that suicides increased 40 per cent. in France after the influenza epidemic. This may be accounted for by the accumulation of uric acid in the body during the diminished alkalinity of the blood, and when the blood regained its normal alkalinity the stored acid was taken into the circulation and produced its characteristic irritability and depressing effects.

In health, about five to eight grains of uric acid are secreted every twenty-four hours, and it is readily soluble in the blood, which is slightly alkaline. If there is increased formation of this acid no harm results, so long as it is promptly eliminated and the ratio between it and the urea is not disturbed.

Haig found that by diminishing the alkalinity of the blood he freed it from uric acid, relaxed the arterioles, relieved headache and mental depression. Increasing the alkalinity, increased the acid excretion, contracted the arterioles, slowed the circulation of the blood and caused languor, depression, headache and, in epileptics, a fit. Epilepsy, migraine, spasmodic asthma, etc., are, like neurotic catarrh, functional nervous diseases. What Haig says concerning epilepsy and migraine may be affirmed of asthma and nervous catarrh: "They may come on early in life, last for years, or the whole of life, tend to recur at more or less regular intervals, are met with in members of the same family, may afflict one and the same patient—now a fit, now a headache—alternating or together. Epilepsy and headache, gout and rheumatism are very commonly met with in the same family."

Broadbent thinks that the convulsions of epilepsy are brought on by the slowing of the circulation, and

consequent cerebral anemia, in the same way as convulsions after great hemorrhage. As we have seen, the effect of an excess of uric acid in the blood vessels is to contract them, which, in the vessels of the brain, produces cerebral anemia. This condition appears to obtain in nervous catarrh, and the attacks are relieved by such remedies as nitrite of amyl, etc., which relieve anemia of the brain.

This uric acid theory of nervous catarrh is not antagonistic to the present status of medical opinion or surgical treatment, but on the contrary, explains questions that were inexplicable before. As a tumor or hypertrophied bone may give rise to convulsive seizures in epilepsy, and as its removal may be followed by relief, when no other structural cause exists, so in nervous catarrh, where new growths and other lesions of the nasal mucous membrane are present, the attack may be started by the accumulation, and the suddenly setting free of uric acid. This precipitates the paroxysm by its irritant action, which finds expression in the group of symptoms characteristic of nervous catarrh or asthma, instead of some one of the other allied diseases. The particular form of manifestation may be determined by the growth, or seat of irritation, located in the nasal cavities. Where this is the only determining factor of the nature of the morbid symptoms, no other organic disease having resulted from the long-standing trouble, the removal of such a peripheral source of irritation may give relief from these symptoms, but it may not prevent the uricacidemia from switching off into other kindred lines of disturbances, if it be not corrected.

This uric acid theory makes clear the reasons why some persons suffer from attacks of nervous coryza under certain favorable conditions in winter, as well as during the warm months. It also unifies all the various forms of hay fever. They are all variations of nervous catarrh.

Patients of this class are sometimes affected more

or less by functional aphasia. Haig's father suffered from time to time for a large part of his life from this trouble, and in old age had organic aphasia with right hemiplegia. The same functional disturbance afflicted Haig very markedly, at times of excess of uric acid in the blood, with mental depression, lethargy and headache. The histories of such cases are paralleled by the histories of nervous catarrh in many families.

The periodicity of nervous catarrh has a counterpart in migraine that comes once in every seven, ten, fourteen or thirty days for years or for life. It may last one day or less, rarely two, and is worse in the morning.

In the last published paper of the late A. Reeves Jackson he expressed his convictions that various neurasthenic symptoms, sleeplessness, headache, vertigo, neuralgia, muscular twitchings, vaso-motor disturbances, vague pelvic symptoms, etc., are dependent really upon the lithic acid diathesis. He wrote: "If this fact were duly recognized it would remove some of the cases from the list of those which are an opprobrium."

L. C. Gray says: "Influenza, ague and other fevers store up uric acid in the body."

There are several causes that determine the manner in which the irritation produced by an excess of uric acid may express itself. These are central, peripheral and hereditary causes. "The structure of the nerve centers and the distribution of its vessels not only determine the kind of disturbances which uricacidemia will produce in any given case, but also explains why one individual suffers in this way from functional nervous disorders, while another with about as much uric acid in his blood and body escapes. When the nervous system is depressed by fatigue, deficient food, etc., a smaller amount of uric acid in the blood will suffice to produce disturbance of function than at other times. If uricacidemia is prevented, the nervous system will not itself originate disturbances.

This knowledge of the effects of lithemia gives complete power to produce or remove the vascular conditions, and the nervous disorders which are secondary (consequent upon) these conditions, by proper diet and treatment." (Haig.) The arguments that apply to migraine are just as forceful in the case of nervous catarrh. The peripheral causes, neoplasms, hypertrophies, etc., have already been considered.

Heredity is probably the chief factor in determining the direction in which the uric acid diathesis will afflict an individual, whether it result in migraine, angina pectoris, asthma, nervous catarrh or some other neurosis; but undoubtedly accidental or acquired conditions may act as directing or localizing agents. For example, of the latter class: a student who is predisposed to such a neurosis accidentally inhales the fumes of burning phosphorus in the laboratory, and this excites the first attack of his nervous disorder, which naturally under these conditions takes the form of asthma. On the other hand, many attacks of severe cold, or some injury to the nose, or the development of a polypus, may determine the nasal form of neurosis, or nervous catarrh. I have such cases in mind.

I believe we can produce and control attacks of nervous catarrh at will by treatment and diet, the same as we can migraine. I was first led to experiment with an anti-uric acid treatment of nervous catarrh by my endeavors to find a solution to the problem, why paroxysms of this disease attack sufferers regularly in the morning. These attacks come on about the same time, morning after morning; although the previous afternoon and evening may have been free from suffering, and the night one of restful repose, with no direct access of dust-laden atmosphere from without, and no change in the contents of the sleeping apartments. The following facts appear to answer this question: the blood is the most strongly alkaline between the small hours of the morning and 9 A.M., when it reaches its great-

est alkalinity. The more alkaline the blood, the more freely soluble is the uric acid. Therefore, in the morning hours the blood is the most heavily charged with this irritant, and during these hours patients suffer the most from angina pectoris, migraine, asthma, nervous coryza and other functional nervous disorders.

The blood is the most acid during the hours of bodily activity, and it reaches its maximum of acidity about midnight. During this time there is only a small secretion of uric acid, and the amount circulating in the blood is minute. As the blood begins to increase in alkalinity in the morning it dissolves the uric acid out of the more alkaline tissues in which it has been stored, the liver, spleen, cartilages, joints and fibrous tissues, and with the increasing alkalinity and solvent properties of the blood it becomes rich in uric acid until it produces the drowsiness, heaviness or other nervous phenomena peculiar to any given case.

ABORTIVE TREATMENT.

With these facts in mind, I attempted to break up the morning attacks of sneezing and nasal stenosis, by doses of acid at bedtime and on first awakening in the morning. The experiment was a success. A series of wretched mornings was followed by freedom of respiration and a sense of well being that seemed like a physical millennium. After this result of preventing the morning increase in the alkalinity of the blood, in order to prove the correctness of my deductions, I used an alkaline treatment, and was both delighted and disgusted with the results. The old enemy raged again, but here was clinical proof of my first proposition. I have successfully repeated these experiments until I am satisfied of the correctness of these conclusions.

The first acid I used for these experiments was the dilute sulphuric acid in doses of twenty or thirty drops in water, but on account of the griping pains and diarrhea that it produced in the early morning,

I was obliged to substitute another. It occurred to me to try Horsford's acid phosphate that I had used for other purposes some years since, on the recommendation of the late Dr. Jewell. I used teaspoonful doses of this without any ill effects, and with the result of giving complete immunity from suffering. One or two teaspoonfuls in a glass of water at bedtime, and on first awakening in the morning were sufficient to break up the habit entirely. In a few days after the symptoms ceased to appear in the morning, this dose was omitted. The night dose was continued until the habit seemed to be entirely broken up. If any nasal irritation reappeared, a dose or two would dispel it. By adding sugar to this acidulated drink it makes an agreeable lemonade, but it is better to avoid the sugar, and as much as possible all other uric acid-producing substances.

While I have depended on the mineral acids to keep down the morning alkalinity of the blood, Bence Jones claims that citric acid (lemonade) will accomplish the same result. I have made it a point to have the morning dose well diluted with water, for the purpose of starting perspiration, for I have observed that as soon as a patient has sneezed violently enough to produce free sweating, the symptoms either decreased or disappeared. The sweating carries off uric acid and helps to free the blood.

I am aware of the differences of opinion that exist concerning the influence of an excess of dilute phosphoric acid on the elimination of uric acid, the effects of acid on the tubules of the kidneys, and the relation of a meat and vegetable diet to the formation of uric acid; but I am careful to use only so much acid as is required to prevent the maximum of alkalinity from occurring. The acid is used, not with the expectation of eliminating, but of clearing the blood of uric acid, for the purpose of preventing attacks during the season of suffering. If the over-wrought nerves are relieved from this source of irritation, they are much less likely to respond to other exci-

tants, and if the morbidly susceptible condition of the nervous centers is due to the action of the uric acid, its over-sensitiveness to all excitants may be relieved by correcting the uricacidemia. After relieving the suffering with the acid phosphate, I have produced it again by neutralizing the acid with an excess of bicarbonate of sodium, and employing the usual doses. This converted the acid into a ready solvent of uric acid, flooded the blood with it and produced the attacks. In turn I have followed this up with the acid, relieved all the catarrhal symptoms by precipitating the uric acid from the blood into the tissues and produced the characteristic gouty pains. Again, by substituting drachm doses of phosphate of sodium for the acid, I have precipitated all the symptoms of a severe nasal catarrh.

Some other remedies produce effects parallel to the acid treatment. Nitro-glycerin, nitrite of sodium, nitrite of amyl, antipyrin, etc., have a similar effect. Opium raises the acidity of urine, diminishes the alkalinity of the blood and reduces the amount of uric acid. It relaxes the arterioles and improves the circulation of the brain. Iron and lead have a similar effect. Mercury reduces the excretion of uric acid, reduces tension of pulse and produces diuresis. If opium is used the ill effects that follow should be prevented by following up its use with salicylate of soda for a few days to free the system of uric acid. Quinin, so generally used is contra indicated, for according to Quain, it brings uric acid into the blood.

There is one remedy that has proved in my hands invariably unfailing in giving relief, especially when given at the beginning of an attack of nervous catarrh, or common colds. It is for temporary use only, like the acid treatment. I have employed it for the last twelve years or more, and published it a number of times, but in this case it is, like old wine, the better for age. I refer to a combination of atropia and morphia, in the proportion of 1 part of

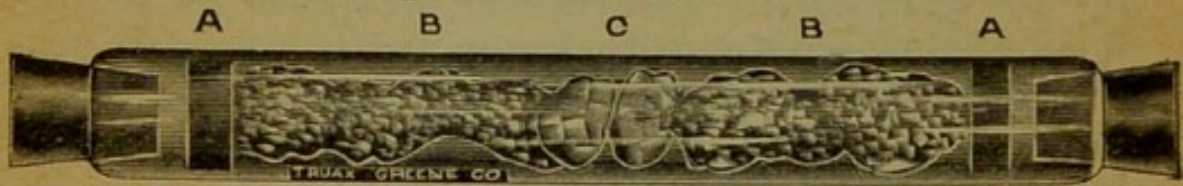
atropia to 50 of morphia. The ordinary adult dose is from one-sixteenth to one-eighth of a grain of this mixture, according to the severity of the attack. It may be repeated in an hour or two, if the first dose does not entirely relieve the sneezing, running at the nose and stenosis. I do not believe it has ever failed to stop an attack when properly adapted to the case. No person has ever acquired the drug habit through my prescribing it. I never write a prescription for it, nor allow a patient to know the composition of the remedy, not for mercenary purposes, for I have more often given it away than I have charged for it, but in order to obviate the possibility of being responsible for a drug habit. The morphia clears the blood of uric acid, diminishes the nervous irritability, suppresses over secretion from the muciparous glands and stimulates the circulation and activity of the nervous centers, while the atropia elevates the tone of the blood vessels, quickens the pulse, decreases all the secretions except the urine, sustains bodily temperature, stimulates the respiratory center, counteracts the constipating effects of the morphia and acts as an antispasmodic.

LOCAL SELF-TREATMENT.

The most useful self-treatment I have found is, first, the use of a convenient pocket inhaler that I have devised for patients who take cold easily. It is called the camenthol inhaler. It can be used in an inconspicuous and expeditious manner in public places where it would be impracticable to combat a sudden seizure with other and slower measures. Several gentle, prolonged inhalations should be taken through one nostril while the opposite one is closed, until the irritation is relieved.

The breath should not be allowed to pass back through the inhaler, but through the mouth instead. The camenthol inhaler does not become irritating to the membrane, like menthol alone, after having been used a considerable time. It is blander and more

soothing than the menthol crystals, iodine or carbolic acid. When the throat is involved, it can be inhaled through the mouth for throat treatment. Second, for home treatment morning and night, I usually prescribe a solution of camphor-menthol in lavolin or benzoinol to be sprayed into the nostrils and throat. The 1 and 3 per cent. solutions are most satisfactory. It is best to begin with the weaker, and increase gradually to the 3 per cent. solution.



PREVENTIVE TREATMENT.

This treatment can not be undertaken to advantage during the season of attacks, except so far as relates to diet. Haig does not believe that excessive uric acid formation takes place, but from a considerable study of this subject, I am forced to the conclusion that an excess of uric acid in the system is not due alone to continued retention and storage of the small normal overflow by the renal vein, but to an increased formation also. In a conversation with Dr. N. S. Davis a few days since, that eminent authority corroborated the latter view. It follows, then, that it is necessary to reduce as much as possible the use of those foods that increase the actual formation of uric acid, such as meats, sweets, beer, wine, etc., and limit the diet largely to fruits, vegetables, milk, fats, etc.

Exercise also aids in the excretion of uric acid, although there may be an actual increase in the amount of acid. Lange treats periodical mental depression successfully by reducing the amount of food and by systematic exercise.

A diet of milk with occasional very small quantities of egg and fish, with no other animal food, will prevent suffering from sick headache entirely, without medicinal treatment. With this diet the natural

ratio between uric acid and urea—1 to 33—is maintained. Haig claims that by a uric acid-producing diet one can store up in the body several ounces of uric acid in a few years—or by correct diet, not as many grains. He has been on such a diet over eight years with almost never a headache. By eating meat and drinking wine two or three days in any single week he is sure to bring on the migraine.

A course of salicylate, salicin, lithium, etc., will remove the excess of uric acid. If an alkali is given it is likely to produce uricacidemia and precipitate an attack of the trouble we are endeavoring to prevent. For an attack, then, a dose of acid should be given to free the blood of uric acid, then the salicylate of sodium should be given for two or three days, or longer, to sweep it out of the body, but the salicylate should not be given during the attack, for it may aggravate the symptoms. For a fortnight, or a month, perhaps longer, preceding the regular season of attacks of nervous catarrh, from two to six grains of the salicylate should be given every day or two, in order to get and keep the amount of the acid in the body down to the normal amount. The copious use of the stronger lithia waters is advantageous also.

This treatment, combined with proper diet, should be successful, provided that there is no organic disease of the structures, central or peripheral. Any organic disease, hypertrophy, polypus, etc., must receive the necessary surgical treatment. A vitiated condition of the blood, or a depressed condition of the nervous system must be corrected. Excesses of every nature must be avoided. All the organs of the system should receive such attention as to secure the harmonious coördination of their functions, for this treatment is directed against uricacidemia only, as a cause of suffering, but it should not be forgotten that there are other causes that may operate to produce attacks, just as in the case of spasmodic asthma arising from bronchitis, irritating gases and other excitants.

I am of the opinion that with the new theory, therapeutics and proper diet of this disease, the medical profession need no longer say to hay fever patients in a patronizing way: Suffer little children, for of such is the kingdom of heaven; but we must recognize and combat the uric acid diathesis if we would bring comfort to these patients and obliterate a stigma that dims the luster of our great art.

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