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Some Points in the Diagnosis and Nature of Certain Functional and Organic Nervous Diseases.*

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LITTLE by little is knowledge gained. This is especially the case in regard to a knowledge of the medical sciences. Facts accumulate slowly. It is rarely alloted to one mind to add more than what seems to be a trifle to our stock of knowledge. When a supposed great discovery is announced the medical world is "all agog" to see who can be the first to verify it, but it is exceedingly rarely that much advance is made in this way. It is to him who by careful and painstaking observations adds his mites to the facts accumulated, that we are indebted for the steady progress in medicine. In an admirable paper, entitled "On Some Points in the Action of Muscles," which appeared in the Spring Number of *Brain* for the present year, Dr. C. E. Beevor, of England, submitted, in conclusion, the following:

1.—Examination of the Muscles, when they are visible, in contraction on the living body, gives the most exact results as to their actions.

2.—The antagonists of a muscle cannot be observed to contract in violent voluntary movements. In slow, moderate movements, it is doubtful if the antagonists do more than moderate the fall of the limb by gravity, while in very fine, exact movements, it is probable that both sets of muscles act together.

3.—As far as we know there is no instance of a muscle producing an action diametrically opposite to its usual action.

4.—A muscle of the limbs can be paralyzed for one kind of movement and not for another.

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5.—And this condition would point to the lesion being in the nuclei of the spinal cord or its roots and not in the peripheral nerves or (in) the muscles primarily.

I have seen within a few months five cases that illustrate the importance of a study of the action of certain muscles for the purpose of diagnosis.

I have studied the action of the pectoralis major muscle only in investigating differences exhibited by muscles paralyzed by brain or cord lesions. This muscle, as you are aware, is composed of two parts, the sternal and clavicular fibers. The clavicular portion aids in elevating the humerus and in holding it at right angles to the body when weights are held in the hand. The sternal portion is a depressor of the humerus. Thus when one portion of this muscle acts separately it becomes an antagonistic to the other fibers and draws the humerus in a directly opposite direction to that given by the contraction of the opposing fibers. Both sets of fibers act together as one muscle in carrying the arm across the front of the chest. The sternal portion seems to exert the greater force in carrying the hand to or beyond the median line of the body, when the arm is hanging by the side of the body and the clavicular portion the greater force when the arm is held at right angles to the chest by the deltoid, unless force is opposed to the movement, when both sets of fibers come out prominently in contraction.

The normal action of the pectoralis major muscle is best studied when the chest is bare and probably it can be as well observed on one's own person as on that of another.

Beevor thus describes his method of examining the action of this muscle:

Voluntarily abduct the humerus away from the chest wall by the deltoid to the horizontal line, then slowly carry the arm horizontally forwards towards the middle line and at a certain angle, which varies with different people, the upper fibers of the pectoralis major suddenly start out and carry on the movement. If now the advanced humerus be voluntarily forcibly carried against an obstacle towards the middle line

the whole muscle, including the upper and lower fibers, contracts vigorously. Again, if the horizontally advanced arm be raised upward against an obstacle, as in holding a dumb-bell out straight in front, the upper fibers alone contract and the lower sternal fibers relaxing, the sharp edge of the contracting upper fiber can be readily felt and seen. On the other hand, if the humerus be then depressed from that position by pressing down on a mantel-piece, the upper clavicular fibers are relaxed and the lower sternal fibers are vigorously contracted.

Dr. Beevor states that he accidentally discovered that this muscle might be paralyzed for one movement and not for another; and that while the upper fibers failed to contract in attempts to raise the arm, they contract quite vigorously when acting in association with the lower sternal fibers in carrying the arm across the front of the chest. He believes that when this muscle is affected for one motion and not for another, or has one set of fibers partially or totally paralyzed, the other portion of the muscle acting normally, the lesion producing the paralysis is in the spinal cord and not in the brain, nerves or muscles primarily.

The first opportunity I had to test the value of Dr. Beevor's conclusions, after reading his paper, was in a case seen in consultation with Dr. Tucker, of Colorado Springs, in the person of a little girl, about ten years of age. The diagnosis was between multiple neuritis and acute poliomyelitis anterior. The asymmetry of the paralysis and its irregular distribution, with the total absence of any objective sensory disturbance, pointed quite conclusively to poliomyelitis. The clavicular portion of each pectoralis major failed to contract in attempts to elevate the arm, although the sternal and clavicular portions acted together in resisted efforts to bring the arm across the chest. Owing to the extreme illness of the child on account of the involvement of the cervical region of the cord, only the most superficial examination was made into the action of the pectoralis major in this case, and I felt undecided as to whether we had in this method of examining into the actions of muscles another reliable means of differentiating polio-myelitis from multiple neuritis. Everyone who has

seen many cases of either disease at times feels sorely puzzled in regard to the diagnosis, especially so when he knows that occasionally both affections may occur at the same time in the same individual.

At present I have four patients (one a hemiplegic from brain lesion, the second a cripple from chronic polio-myelitis, and the third and fourth suffering from acute polio-myelitis) in the Arapahoe County Hospital, on whom I have repeatedly and carefully studied the actions of the great pectoral muscles, as well as the irritability of the clavicular and sternal portions to electricity.

CASE I.—A hemiplegic, right-sided paralysis with motor aphasia extending over a period of two years. The great pectoral muscle is paralyzed for all its movements, but each portion of the muscle responds nearly normally to the faradic current.

CHRONIC POLIO-MYELITIS.

CASE II.—J. R., æt. 30, tinner, whose arms have been getting weaker for two or three years, entered the hospital about two months ago. There is great wasting of the muscles of the arms, more marked below the elbows. The triceps and biceps of each arm are weak and small. The deltoids are rather weak, but still retain sufficient power to bring the arm to the horizontal position. They are not as much wasted as is usually the case in this disease. The pectoralis major muscles are both extremely weak and wasted, the left being more affected than the right. The trapezii are wasted, the left to a greater extent than the right. The latissimus dorsi of each side is paralyzed and atrophied. He is unable to voluntarily elevate the left arm above the horizontal line. There is no objective or subjective sensory disturbance. The anterior tibial muscles are weak, allowing the feet to drop in walking.

Pectoralis Major: Right—The superior fibers stand out prominently in aiding in holding the arm in the horizontal position and become more prominent in contraction when an effort is made to raise the arm above the head. The sternal fibers remain quiet. I now hold the arm in the horizontal position in front of the chest and request him to bring it down against the resistance offered by my hand. In the attempt to bring the arm down the shoulder

rises before any of the fibers of the muscle contract, and finally a few of the inferior fibers contract, but exert but little force although he does his utmost to bring the arm down, and the extraordinary effort causes the superior fibers to contract and counteract the force exerted by the opposing portion of the muscle. The superior fibers carry the arm over the front of the chest while the inferior fibers remain at rest, but when resistance is offered to this movement a few of the inferior only contract. The superior portion of the muscle reacts more readily to electricity than the inferior.

Left.—The action of the muscle and its reaction to electricity is about the same as on the opposite side, except that the superior fibers are weaker on this than on the right.

ACUTE POLIO-MYELITIS WITH SOME PERI-NEURITIS.

CASE III.—J. W., æt. 42, plasterer, has been suffering from acute polio-myelitis four weeks. The right leg is almost completely paralyzed and he suffers with considerable pain in the right hip. Only a few muscles of the left leg are affected, mainly the anterior tibial, and peroneus group being paretic. Nearly all the muscles of the right hand, arm and shoulder are more or less completely paralyzed. He suffers with considerable pain in the shoulder and the muscles around the shoulder are sensitive to pressure, but the greatest tenderness is found over the superior fibers of the pectoralis major. In the left arm all the muscles below the elbow are fairly strong, but the muscles of the upper arm and shoulder are nearly completely paralyzed. The shoulder is the seat of slight pain and the muscles surrounding it are somewhat sensitive to pressure. The superior portion of the pectoralis major is acutely sensitive to pressure. The senses of touch, pain, temperature and posture all over the body and limbs are normal.

Pectoralis Major: Right.—The arm is placed in the position above described and he is requested to raise it. On his attempting to do it the shoulder is raised, the inferior or sternal portion of the muscle contracts feebly and depresses the arm, but the superior fibers remain flaccid. In bringing the arm to the side the inferior fibers contract feebly, the superior ones remain at rest. He is unable to draw the arm across the front of the chest, but in attempting to do this the inferior fibers contract as before and the superior portion of the muscles still remains inactive. To

a strong faradic current the sternal portion responds, but the clavicular portion shows no response to the strongest current that he is able to bear.

Left.—The action of the muscle is the same as on the right side in attempting to raise the arm. In bringing the arm down the inferior fibers contract vigorously and force the arm down against considerable resistance. When the arm is held for him in the position for testing the simultaneous action of the sternal and clavicular portions of the muscle he is able to carry it across the front of the chest, the inferior fibers acting vigorously, the superior ones feebly. The clavicular fibers respond feebly to a strong faradic current, whilst the sternal fibers contract about normally to a moderate current.

On the 20th of October, 1891, Dr. M. Baker, the County Physician, very kindly brought a young man to consult me that had been nnder his care a short time at the dispensary of the county:

Case IV.—The patient is an expressman and accustomed to handling heavy packages, but he is not aware of having strained or in any way injured his arms or back. He had syphilis two years ago. About five weeks before I saw him he began to suffer with "rheumatic pains" in the left shoulder. He was treated for rheumatism for three or four weeks and no examination of the shoulder was made. After Dr. Baker examined him he suspected neuritis but did not feel confident in his diagnosis. On examination I find the right arm strong and normal in every respect. The legs are unaffected. The left arm hangs by his side and he is powerless to abduct it, although he can move the forearm fairly well, the hand registering, on the dynamometer, 88; the right hand, 128. The biceps, triceps, deltoid, pectoralis major and middle portion of the trapezius, are paralyzed, either partially or completely. The deltoid seems to be the only muscle that is completely paralyzed. There is considerable wasting of the muscles affected. Measurements: Forearm (relaxed)—right, $9\frac{1}{8}$ inches; left, $8\frac{7}{8}$ inches. The upper arm of the belly of the biceps during contraction: right, $10\frac{1}{8}$; left, $8\frac{3}{8}$. Over the deltoid, as high up in the axillary space as possible: right, $10\frac{3}{4}$; left, $8\frac{3}{8}$. Reflexes of the left forearm normal, but those of the biceps and triceps of the same arm, absent. Tactile sense is normal in every portion of the arm.

There are no sensitive spots in any portion of the arm, although he complains of more or less dull pain in elbow, in arm about four inches above elbow joint and in the shoulder (left). When the muscles are relaxed the arm at the elbow and shoulder can be moved in every direction without causing pain. The nerves of the arm are not sensitive to pressure.

On raising the extended arm to a horizontal position and bringing it to a point about midway between the lateral and front portion of the chest, he is requested to elevate the arm, but he is unable to do it and his attempts cause none of the fibers of the pectoralis major to contract. The lower or sternal fibers of this muscle contract vigorously and depress the arm with considerable force. On carrying the arm to the former position and requesting him to bring it in front of the chest, both superior and inferior fibers of the pectoralis major contract and carry the arm across the front of the chest against considerable resistance offered by my hand.

On comparing the response of the deltoid and great pectoral muscles of the right (healthy) and left (affected) sides, I find that the left deltoid will contract only when the faradic current is very strong; that the inferior portion of the left pectoralis major contracts nearly as readily as the corresponding portion of the right, whilst the clavicular portion of the left requires a little stronger current than the corresponding fibers of the right, but not nearly so strong a current as is necessary to cause contraction in the left deltoid. The paralysis is undoubtedly due to cornual myelitis.

The above cases require but little comment, as they seem to substantiate the observations and conclusions of Dr. Beevor. As yet I am not aware that any case of paralysis, due to disease of the nerves, has been examined in order to determine whether a muscle so paralyzed is paralyzed for all, or only some, of its normal actions. Theoretically, paralysis resulting from diseased nerves should involve all the muscular fibers supplied by the affected nerves.

Pathology and experimental physiology seem to justify the conclusion that the motor cells in a given segment of the cord innerve, through the motor-nerve roots, the muscular fibers of certain muscles that act in association

with other muscular fibers (of different muscles) supplied by nerves coming from the same or adjacent cord segments and that this holds true, although the muscular fibers that perform these associated movements are found in muscles some distance from the others and are apparently supplied by nerves coming from different segments of the cord.

As opportunity offers I shall endeavor to further investigate this subject to ascertain whether a muscle may be paralyzed for one movement and not for another when the paralysis occurs from nerve lesions. From the negative results obtained by studying paralyses of brain origin, it is very probable that such paralyses are never of this character.*

Headache:—There are headaches and headaches; some due to one cause and some to another. Nearly three years ago I accidentally learned the value of salicylate of sodium in relieving some headaches and in preventing others. I also found that the administration of an acid, especially nitro-muriatic, would in some cases remove "a fit of the blues" or relieve a headache. In a great many cases of headache both agents seemed to increase, rather than relieve the suffering. I had no rule to guide me in administering these drugs for the relief of this class of sufferers and but rarely gave them to relieve headache, although I continued to prescribe an acid for persons suffering with a temporary depression of spirits, until I became acquainted with the investigations and conclusions of Dr. Haig, of London, published in the Spring Number of *Brain*, of the present year. I was familiar with his numerous essays previously published from time to time in various medical periodicals of England, on the relation of the influences of certain drugs

* It will be observed that in some of the cases that I have reported there was simply a paralysis of one portion of the pectoralis major for all movements, both single and associated. It is probable that such a paralysis might occur from nerve injury, but I am not aware that even this has been observed. Only the left pectoralis major of Case III., and both great pectoral muscles of Case IV., of the cases that I have reported, show portions of a muscle paralyzed for one movement and not for another.

and conditions of the body to the excretion of uric acid, but from these I was unable to make sufficiently practical deductions to guide me in the management or cure of certain forms of headache. His valuable paper in the number of *Brain*, to which I have referred, is replete with common-sense suggestions and if his experiments and observations, both on his own person and on those of others, should lead to the relief of certain forms of nerve storms, many a periodic sufferer will have cause for gratitude to him.

His claims may be briefly stated as follows: The tissues of the body are capable of storing up uric acid, which, when getting into the blood in undue quantities, causes irritation of the nerve centers, especially in the brain, and headache, depression of spirits, an attack of hysteria, or, in those subject to epilepsy, a convulsion, results in consequence of the uric acid irritation. In such persons he claims to be able at will, by the administration of certain medicines, to lessen or increase the amount of uric acid excreted in the urine, or cause or relieve a nerve storm due to uric acid irritation.

The agents which he has found to diminish uric acid excretion in the urine are, acids, iron, lead, opium and mercury and those which increase it are, phosphate of sodium, the salicylates, and sodium and potassium under certain conditions.

The treatment for periodic headache or depression of spirits is to give an acid, which he thinks drives the uric acid of the blood into the tissues and thus stops the irritation, followed the next day or two by a few doses of salicylate of sodium, which is a solvent for uric acid and at the same time aids in its excretion by the urine. He thinks the uric acid diathesis cannot be broken up by medicines, but must be counteracted by a diet consisting of vegetable food, milk and small quantities of fish and eggs.

Dr. Haig was a great sufferer from periodic headache until several years ago, when he adopted for himself the

above diet. Since then he has had only an infrequent headache and this has been readily relieved by the administration of an acid.

For the diagnosis of uric acidemia, the name given by Von Jaksch to the condition described by Dr. Haig, I will give the symptoms in his own words.

> I must say a few words on diagnosis of the above disturbance of the nervous system as the result of uric acidemia, lest it should be said that I claim all forms of headache, epilepsy and mental depression as due to uric acid, which is very far from being the case.
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> As regards the uric acid headache, the chief points are that it is periodical; that it comes once in every seven, ten, fourteen or thirty days for years or for life, often beginning in childhood; that it lasts one day or less, rarely two days and that it tends to be worse at those hours at which the uric acid is normally greatest.
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> I have seen headaches which bore superficial resemblance to it, but differed in lasting practically without intermission for seven to ten days. This, I think, should put the ordinary headache of uric acidemia out of the question and search should be made for organic disease or nephritis, though I am not prepared to say that the headache of nephritis is not in some cases due to chronic uric acidemia, but then the uric acidemia in this case is probably due to an organic and not to a functional cause.
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> The family history, again, is often very characteristic, many members suffering from headache, often called "bilious," with a history of gout, rheumatism and, not very rarely, phthisis.
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> Last, but not least, there are the slow, high tension pulse and cold extremities, the uric acid reaction in the urine, which I have described, and often very decisive effects of drugs and diet.

In conclusion, I will now give the results of some of my own experimental observations made during the last three months upon persons suffering with headache, depression of spirits and hysteria:

Headache:—I first began by giving an acid, usually two or three drops of the nitro-muriatic to all persons suffering from headache, regardless of the cause of the head pain, simply to determine what class of cases were benefited by it. All headaches due to a foul stomach were usually made worse by it. This was especially the case where the gastric disorder had been brought on by over-indulgence in food or drink, or other indiscretions in diet. In brief, all headaches brought on by some

readily traceable cause, whether they occurred in persons subject to the periodic headaches or not, were never more than temporarily modified by the administration of an acid. In cases where the headache lasted more or less constantly for several days, an acid, for a dose or two, would seem to be attended with considerable benefit, but in a few hours the pain would be as bad as it was before the acid had been first given and then a repetition of the dose was unattended by any apparent relief. In these cases the amount of uric acid excreted by the urine would at times be increased and at others diminished. Save for diagnostic purposes I soon abandoned the use of an acid for the relief of headache, except in persons who were subject to periodic attacks. I found that some of these were promptly eased of pain, whilst others seemed to get but partial relief. At one time the pain might disappear like magic and at another time the same person would experience but little if any benefit from the acid. I soon learned that the sooner an acid was administered after the first symptoms of an approaching headache appeared the more likely was a headache to be aborted and if it was not given until after the stomach had become disordered it was less prompt and certain in its effect on the pain. On testing the urine passed before and after the attack, it was found almost invariably that the uric acid was decreased before the attack and increased subsequently on the administration of sodium salicylate. Between the attacks the uric acid excreted by the urine could be decreased by giving a few doses of an acid and as readily increased by administering a few doses of fifteen grains each of sodium salicylate. When a case presents the history of periodic headaches, occurring every week or every two or three weeks and lasting only a day or so at a time, I feel encouraged to try the acid and sodium salicylate treatment with some prospects of success in giving relief. In cases presenting a mixed history of periodic and non-periodic headaches, I employ the treatment for diagnostic

purposes, after excluding all probable organic causes of headache.

I am in the habit of giving my patients who suffer from periodic headaches an ounce bottle of muriatic or nitro-muriatic acid and a box containing a number of fifteen-grain powders of sodium salicylate, telling them on the appearance of the first symptoms that usually precede a headache to take two or three drops of the acid and repeat the dose in an hour's time if any symptoms are still present. In many instances one dose of the acid is sufficient to abort an attack and in others it has to be repeated two or three times before the patient is relieved. On the evening of the same day, if the stomach is not rebellious, one of the salicylate powders is taken and one or two more on each of the two succeeding days. This last precaution is to get rid of the accumulated uric acid in the system. If it is found that they succeed in aborting a headache, the patient is requested to conform as nearly as possible to the diet which has proved so successful in Dr. Haig's experience on his own person. In addition to this I insist on regular exercise every day possible in the open air and frequent sponge-bathing of the entire surface of the body, usually, when practicable, a warm sponge bath at bed-time and a cool sponge bath in the morning on rising, each followed by brisk rubbing with a coarse towel.

Depression of Spirits :—There are a number of persons who feel depressed in early morning and get brighter and feel more vigorous as the day wanes. Dr. Haig has endeavored to account for this on the theory that uric acid accumulates in the blood during sleep and acts as an irritant or depressing agent on the nerve-centers in the early morning hours. As yet I have made no observations on this class of persons to determine whether the amount of uric acid excreted by the urine in the early morning hours varies from what is found in health. In a number of instances, however,

I have succeeded in removing the depressed feelings by having the patient take an acid on awaking in the morning. In others the feelings have apparently been prevented by taking fifteen or twenty grains of salicylate of sodium on retiring.

Hysterical Attacks :—It is not an uncommon experience to find certain neurotic individuals, especially of the female sex, given to apparently causeless manifestations of hysteria, such as fits of laughing, crying, anger, sighing, irritability, with excessive nervousness. Since experimenting with the acids, and sodium salicylate, on certain nervous states, I have met with two cases of this character. These have been under my care for some time and I have had favorable opportunities for studying their cases and watching the effects of this treatment when compared with previous means resorted to, to control their nervous outbreaks.

One is a lady, æt. 41, married. She has suffered from uterine trouble for four or five years and has become exceedingly emotional and hysterical, although she was quite nervous before the local difficulty developed. The attacks are frequently preceded by several hours of exhilaration, during which she talks rapidly and animatedly, and laughs excessively, even at trifles. This stage is frequently followed by a restless night, during which she is depressed, apprehensive and sleepless. By the early morning she is crying and moaning for hours, but if an attempt is made to quiet her she has periods of sighing. The whole period of the attack, including the stage of excitement, usually lasts from twenty-four to forty-eight hours and is followed by considerable physical prostration. During this time she complains of pain in the back of the head, in the upper cervical and lumbar regions of the spine. If nothing occurs to annoy her (which is rarely the case, as the merest trifles are sufficient for this purpose,) the attacks are light, of short duration and may occur only once every two or three weeks. On the other hand, if she is greatly worried the attacks are quite severe and may follow each other in rapid succession.

I have studied several of her hysterical paroxysms and examined the urine both before and since the anti-uric

acidemia treatment was begun. The quantity of uric acid excreted by the urine has been so variable without any apparent cause that as yet I have been unable to come to any definite conclusion as to the relation of this constituent of the urine to the hysterical outbreaks. I have found that an acid given on the first symptoms of the approach of one of these nervous manifestations will at times prevent an attack; at other times it seems to modify it and yet, again, the medicine may have no appreciable effect. On closer observation, it was found that those nervous outbreaks that seem to come periodically and are ushered in by the slightest cause, yield most readily to the administration of an acid and, on the other hand, those attacks that are brought on and kept up by worry are least influenced by the treatment and will often last several days. It is possible in this patient to increase or lessen at will the quantity of uric acid excreted by the urine by the administration of alkalies or acids.

I have not been able to satisfy myself whether in this case the hysterical attacks give rise to the variations in uric acid excretion or are caused by it. It is a very knotty problem to solve and can be done satisfactorily only after months of patient observation, with repeated careful analyses of the urine.

All the seizures are followed by abundant flow of clear and almost colorless urine of low specific gravity.

The other hysterical subject to whom reference has been made is a lady, æt. about 35. She is married, but has borne no children, is of good physique and always enjoyed good health with the exception of periodic headaches, dating from puberty, and hysterical paroxysms during the last four or five years. She has lived in Colorado ten or twelve years. The first four or five years spent here seem to have favorably modified her headaches, but of late they are as severe as formerly and generally more frequent than before coming to Colorado. The headaches occur about twice a month and the hysterical attacks weekly, usually on Sunday morning; but the latter may be brought on at any time by worry, excitement

or fatigue. Formerly the hysterical seizures were apparently attended with greater excitement and more mental aberration than at present.

She is bright and intelligent and naturally of an even disposition, unselfish and patient. On Sunday morning she usually wakes feeling low-spirited, depressed and irritable. The slightest annoyance will then throw her into a paroxysm of frenzy. If her husband, to whom she is devoted, walks heavily across the floor or pares his fingernails, as happened the first Sunday I was consulted on account of her condition, she flies into a violent rage, accuses him of trying to annoy her, uses abusive language toward him and at times will throw things at his head. She will then cry and sob and usually spends most of the remainder of the day in fault finding and bemoaning her fate. She generally succeeds in making herself and everyone around her quite miserable. During the latter part of the day a free flow of almost colorless urine takes place and she soon becomes less nervous and excited, goes to bed considerably exhausted, awakes next morning much improved, but remains somewhat nervous for a day or two. On inquiry I find that the outbreaks are not limited to Sunday, but are likely to occur almost any time if she has greatly fatigued herself the day before. Excitement or worry will bring on a paroxysm. I find that the majority of the attacks have probably occurred on Sunday, because she is frequently accustomed to exerting herself to the point of positive fatigue on Saturday.

On analyzing the urine I find the paroxysms are preceded by lessened quantity of uric acid excretion and followed by an increased quantity. The administration of a dose of an acid at the beginning of an attack usually lessens its severity or breaks it up entirely for several hours and one or two more doses carry her over the critical period. At this time, after giving an acid, the urine shows lessened quantity of uric acid, but on giving sodium salicylate it is increased beyond the normal for a

day or two. Her headaches have been treated in the same manner as her hysterical attacks and apparently almost as successfully if the acid has been administered before the headache has existed long.

It has now been some ten or twelve weeks since this lady first consulted me and by careful regulation of diet and exercise and giving an occasional dose of sodium salicylate and an acid on the first evidence of unusual nervous disturbance, she has had but one headache and has experienced great relief from her hysterical paroxysms during this entire period.*

I feel that the whole subject of uric acidemia requires careful investigation. Whether the results of Dr. Haig's experiments and observations are as important as he believes, remains to be proved. Certainly they seem plausible and should receive the attention of physicians. I am engaged in investigating the relation of nerve-storms to the excretion of uric acid and hope to report at length after I have had my cases under observation for several months, or a year or more.

* The attacks have again returned and seem to be less influenced by Haig's anti-uric acidemia treatment.