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A Thesis

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The subject of the treatment of chorea by large doses of arsenical has for some years been an almost universal practice, and it is with reference to the neuritis produced by a too-long administration of that drug that I propose to write.

I might say that 25 years ago was about the beginning of this practice, as before then, no one thought of giving more than a few minims of Fowler's Solution but since then the practice has become universally popular. It is needless to say, that all careful observers are agreed, that a large percentage of chorea cases would get well simply treated with rest in bed without the aid of any medicine; but on the other hand, there are those very severe cases, which formerly resisted all treatment, and which now, if it were not for...
full doses of arsenic, would still run the unsatisfactory, and chronic course, which alike so disagreeable to patient and to friends. How I was fortunate, or unfortunate enough, to have three cases which developed a peripheral neuritis, to which, through their course, were under my close observation, and on which I was able to take some notes. How it is these cases, together with a few cases I have collected, with opinions on them, which I shall now put before you.

Case I. E. K. a girl age 15 was admitted to the Northampton General Infirmary Dec. 1, 1895. Suffering from chorea and heart disease. She came under my care on Jan 11. 1896, when almost all choreic movements had ceased. The history of her present illness was, that in the commencement of October 1895, her parents noticed her beginning to fidget as they expressed it, slightly at first, then steadily settling worse, dropping things, and unable to keep still for a minute. They brought her in on Dec. 1. and she had then been treated with the
usual routine method. Starting with m/7 of Fowler's solution three times a day, and increasing m/7 each day. This continued till the 12th. When she was taking m/1 T.S. when she complained of nausea. It was then discontinued for three days, and on the 15th she was started again on m/5 T.S. again increasing m/7 daily till the 26th. When she again complained of nausea, it was stopped again for three days, and as the symptoms had almost ceased she was put on m/3 on the 28th and had continued that till I had seen her. I then took full notes.

Her family history was good. Her father and mother, three sisters and two brothers all being alive and well. Surroundings at home were good. The patient was happy at home, where she had helped her mother.

She had a bad history of rheumatic fever twice, once at the age of 8! and again at 72, but she was supposed to have got well over them.

She appeared pale, pasty and rather puffy about the face and had oedema of the ankles. She was 5 ft 2 in in height and appeared...
fairly well developed. She was propped up with pillows, and said that she always got palpitation if she lay down, with breathlessness. Beyond having felt rather sick for the last day or two, her alimentary system was normal.

Hematopoetic system also normal. Circulatory system, here was mischief as I expected from her history.

On inspection a well marked heaving impulse was apparent, with maximum intensity about an inch below the nipple on the nipple line. The whole praecordia seemed to heave out at each impulse. On percussion I found heart dulness increased upwards and outwards, and also 3\(^{\frac{1}{2}}\) inch to the right of the sternum. There was obvious enlargement both by percussion and ausculto percussion. Palpation had revealed a well-marked thrill.

Auscultation showed a presystolic and systolic murmur, the latter being loud and blowing and conducted all over chest. The aortic area showed the second sound markedly accentuated. The tricuspid appeared normal. Integumentary system also normal.
Urinary system, a trace of albumin.
with lip cavity 10% sac acid no deposit.
no casts.
Patient complained of tingling, and
pins and needles in the forearms and
legs.
Sensibility to touch was good as also heat
and cold.
Sensibility to pain was exaggerated,
Deep pressure producing great pain.
Muscular tone was poor. Both hands
and legs.
Coordination was good.
There were no refractive errors and
the fundus was normal.
Hearing was poor but no obvious cause.
Reflexes, superficial Plantar absent.
Patellar and abdominal present.
Deep. The knee reflex was quite absent.
The application of only a mild current
of Paralization produced pain.
The extensor muscles of both arms and
legs appeared flabby and wasted somewhat.
with an inclination to foot & wrist
drop.
Mental faculties were good.
The respiratory system was normal.
I stopped the arsenic at once and put
her onto strophantin and iron.
with gentle massage twice a day. Her heart seemed to improve and the oedema slowly went, but the wasting of the extensors increased, and the wrist and ankle drops became quite apparent.

But as the muscles got worse the pain diminished, and on January 30th I found complete drop with inability to flex the foot on the ankle or to thoroughly extend the fingers. The pain had gone so I tested with faradization and galvanism, and with the extensors found no response to faradization, and the reactions of degeneration with the galvanic.

I then put her onto a mild current of faradization, with massage twice daily, and slowly the muscles seemed to improve, to partially regain substance and power. By March 10 she was able to sit about with the aid of crutches, but her walk was peculiar, raising the knee high bringing foot forward, then bringing the heel down first; the whole of the sole of her foot was visible from behind. Her hands and feet steadily improved.
But the knee jerk remained absent by July 1. She could sit about without buttocks, and her friends insists on taking her home.

There seemed partial wasting of the extensors and no knee jerk before she left, and unfortunately, I found that the whole family had gone away and I lost sight of her.

The main point of interest in this case, was the slight gastric disturbance, and the absence of any fever.

She had had about 12 drachms of Fowler's solution, equal to about 6 doses of arsenious acid, during a period lasting from Dec. 1, 1895, to Jan. 11, 1896.

Case II

N.S., age 14, first came under my care on May 13th, '96. Suffering from chorea.
Her family history was good, and she had never had any serious illness.
Condition on examination - Patient was pale and rather anaemic, with twitchings of arms, legs and face, far more on the right side than left. The mouth was the only
part of the face implicated.
She had a comfortable home. The
movements were first observed
about a month before admission,
and at first were confined to the
hand and foot of the right side. Then
gradually extended over the body.
The movements were never violent
and she never hurt herself. And
she was looked upon as a simple
case. There were no reflexion errors.
Her bodily development was fairly
good. She was about 5 feet in height
and weighed 7 stone 8 lbs.
She complained of no pain.
Her alimentary system was normal
and she took her diet well.
Her circulatory system showed no
enlargement of the heart. The apical
beat being well within the nipple
line.

On auscultation, a well marked
mitral systolic bruit was plainly
heard, not very loud, blowing
in character, and conducted towards
axilla.
There was also a soft pulmonary
hence bruit.
Nothing abnormal to be heard in
The aortic region.

There was no dropsy. It would be difficult to say whether the initial
blot had become developed during
the chorea or was prior to it.

The treatment adopted was the
increasing doses of Fowlers solution
starting with m/7.5 and increasing
m/1 daily.

On May 24, nausea was felt, when
she was taking m\(\times\)7.5, so the
medicine was stopped for 3 days.
And then started again at m\(\times\)
7.5, increasing m/7.5 daily.

This time m\(\times\)v was reached before
nausea was produced. When it again
stopped for three days and then
m/7 was given and continued.

At the end of the 4th day the movements
had ceased and the arsenic was
stopped, but she complained of
sleeplessness, and her temperature
went up to 104.5 F. June 13th.

June 14th, wanderings at night.
Temp 102° had been 107 three day.
June 15th, 102 through day 103.5 at
night. Chloral hydras .5 v. post noon
Kv were given and she had a better
night. Temp on the 18th 100 F. at night 101.2.
She did not sleep well that night so on the 17th the draught was repeated and on the 18th the temp fell to 99.8 and normal next day. I could find no reason to account for the temp. but found her knee jerks absent.

June 20th. She complained of tingling and pain in her legs and next day in her arms. I put her on iron and tried slight paracentesis but it was too painful so stopped and slight massage was given.

June 23rd. I found the superficial pains were absent but firm pressure made her cry out. The muscles appeared very tender. There was no knee jerk. no plantar reflex. There was no area of anaesthesia. Heat cold and pain were normal.

June 25th. The extensors of the legs appeared very flaccid and the foot drooped.

-26th she could not straighten her fingers. The right little finger appearing flexed and the 3rd finger partially flexed. She could not flex the foot on the ankle.

June 30th. Complete foot and wrist
drop marked wasting of extensors of arms and legs and flexion of little and 3rd finger of the left hand as well as right. There no longer appeared the same amount of pain as previously. So I tested her muscles with faradization and found I could get no reaction in the extensors. Galvanism produced the reactions of degeneration.

On July 10th I added 50 of aux vomica to her iron. She was now having mild faradization and massage.

If supported her walking was characteristic. She could not stand with her heels on the ground, her toes pointed downwards, and the soles of her feet backwards. In trying to take a step forward, she raised her knee high and threw her foot forward bringing the heel down first. She did not seem to change much. Her general health improved, and she took her food well. The initial murmur was not so loud, but the paralysis continued.
She remained an Inpatient till August 25. When her friends took her out for a change. Her condition had not improved and she could not walk.

I saw her again twice the last time at the end of September but although she could sit about with crutches her legs did not seem to improve much. The left hand was quite recovered. But the two fingers of the right hand were partially flexed. She could stand upright but as she said her toes always wanted to point straight. Since then I have never seen her. But I had a letter to tell me that there was only a slight improvement if any.

I might say that she had never been actually sick. She had empyema and diarrhoea. She had taken in all about 10 drachms to about 3/5 of arsenious acid over a period of 28 days with two intervals of three days.

The interesting points here. The slight faecal disturbance; the fever; The short period of pain superficial to deep; and loss of knee jerk.
Case III

A. M., a girl aged 10, came in August 13th 1996, suffering from choria. Her parents could not say when it began or if there has been any shock or fright which might have caused it. But they thought it had started about six weeks before admission.

They observed it first on the left side, hand, and arm, and also on the chest, but now it was fairly universal. She was a bright kind of child, and seemed to notice everything that went on. Her parents thought she had been made a good deal worse by being teased at school about it. They said she was very fond of school, but that she seemed to work too hard.

She was about 4 ft 5 in. in height and well nourished.

Her family history was good, as was also her own. She was happy at home. Her alimentary, circulatory, and respiratory systems were all normal. Her nervous system was also normal. Her parents said she sometimes complained of headache.
after reading at night, and her eyes on examination I found to have a difference of 1 dioptr of hypermetropia that prin in the left eye, while the right was emmetropic. There was no astigmatism.

Her knee jerks were both present.
She was put on Fowler's solution in T. S. increasing mT daily, she reached mT when she complained of nausea.
It was then as usual discontinued for three days, starting again at mT she went up to mT where she was kept for 5 days, at the end of which time as the movements had stopped the drug was also stopped (Aug 8).
I then tested her knee reflex, but it was not active and by the end of a week was entirely absent. But there was nothing else of any note during the following week.
She complained of pin and needles in her legs and arms.
And by the end of the week, I noticed a decided weakening with a tendency to droop. She could only hold hands straight out with an effort, not for long.
There was not much pain in the muscles, and I could get a reaction by a fairly strong faradise current but it produced pain. She was rather anaesthetic, and sensation to touch impaired on extensor surfaces of both arms and legs. There was no temperature all through her case.

I immediately put her on a weak faradise current, with massage daily, and gave her iron and strychnine. Owing to the absence of pain in the muscles, I thought the muscles would recover soon.

I kept on with this treatment and was glad to find a slow but steady improvement. They were setting firmer, and responded more readily to faradization.

On September 15th, I was glad to find the tendency to droop of the hands was quite gone and the legs were improving when walking. She raised the knee rather high and came down on the flat of her foot, the foot KING
put down well in front of her. By Sept 30 almost all sign of this had disappeared. But there was still no knee reflex. She went out then, and came up at the end of a month, and she was quite recovered. Her knee reflex did not return though till December.

The points of interest here are absence of gastric symptoms absence of fever knee reflex the first sign absence of pain in the muscles how in these three cases as far as I can see, I had no indication that they were getting too much arsenic. This last case had altogether 5 3/4 oz arsenious acid. The doses were never excessive, and on any sign of nausea the arsenic was given a rest for 3 days.

It was taken in these cases just as well, as it was in 20 other cases that had it, in the same way, and for well with no sequelae. I had 10 other cases which I treated differently.
5 of them on sulphate of zinc for 7 d. all of which, except one pot well in a short time, the others on the substitution of arsenic rapidly pot well.

5 of them 2 treated with soda salicylate for 7 5. 4 of these did well, but the 5th did no good on either arsenic or sulphate of zinc. She was neurotic and anaemic and eventually pot well on iron, and slow exercise regularly, which seemed to suit her very well.

I had one other case of the chorea of pregnancy, but no drug did any good, and she only was relieved by artificially induces abortion. She made a rapid recovery then. How I should like to mention one or two cases recorded.

Before the Clinical Society at Manchester the President Dr. Railton M.D. showed a girl age 16. who had been treated in the Manchester Clinical Hospital with Fowler's Solution, for chorea of three months standing. In three weeks the chorea was cured. The doses were given
as follows.

5 m 7 s. for three days.
10 m 7 d. for three days.
15 m 7 s. for fifteen days.
Total for 21 days 13½ drachms of Fowler's solution, equivalent to 63½ grs of arsenious acid.

During the course she showed symptoms of stomach derangement, and two days after the discontinuance of the medicine, she was noticed to be desquamating freely.

Ten days later she could not walk alone and complained of pains in arms and legs. The latter being particularly sensitive to pressure. When she put her feet down she felt "pins and needles." She could not button her clothes.

Thus motor paralysis, sensory trouble and ataxy were present.

The knee jerk which was very active before treatment was lost; she could not flex the feet upon the ankles, and if when supported she tried to walk, she showed the soles of her feet completely
from behind. The affected
muscles of the legs had lost
their faradic reaction, and
showed the "reactions of degen-
eration" with the volaric current.
She could not touch the little finger
with the thumb on the side (right).
The urine was slightly albuminuric.
The President mentioned 9 other
cases of children he had treated
with 15 m doses of Fowler's sol.
three of them for a week only,
and the rest for a fortnight.
Seven had vomiting; one diarrhoea;
three herpes zoster; two erythema
and one peripheral neuritis,
though not so severely as the Case
above mentioned. In all
cases the chorea was cured
at the end of the treatment.
He considered that 15 m doses
were too much, if continued
for more than a week, and
he had determined not to
administer that dose for longer
than that period in future.
(British Medical Journal No. 4, 1893
p. 996).
Dr. John A. Adams records another case on September 15, 1893. Abright girl of 11 years of age was admitted to the
Halifax Infirmary with well-marked cholera.
She had been ill for 2 weeks, and was now, unable to walk, or feed herself. She was at once treated with
a mixture of liquor arsenicalis B.P. T.S.
There was no change during the first week. The movements
then began to fail less, and she continued to improve for a
fortnight, during which she had no symptoms of arsenical
poisoning. At the end of this time she expressed herself as much better, the chronic
movements had almost ceased
she could feed herself, and
was permitted to get up.
On October 8, she complained of
pain, and difficulty in swallowing
when the arsenic was discontinu.
Two days later she said her legs
were painful, and felt numb, and,
on examination, there was found some paresis of the legs.
The calves were tender, secretion
Sensation was also impaired; and the patella reflex was absent on both sides. A day or two later the arms became affected in a similar way, and gradually all the limbs became powerless. The muscles becoming powerless flaccid, and extremely wasted. She was now unable to turn in bed or help herself in any way. The temperature ranged from 99° in the morning to 100° in the evening (on one occasion 101°), and continued so for three weeks. When she gradually began to recover under the use of prepared food, cod liver oil, tincture of burn vomica, massage and Faradism.

On January 12, 1879, the patient had so far improved that she could feed herself, and sit up in a chair, but could not walk properly. The numbness had ceased, and the muscles had regained much of their strength and tone. The interesting point about this case is, in view of the present much advocated use of large doses of arsenic in the
treatment of chorea - the possibility of the occurrence of peripheral neuritis, without any of the cardinal symptoms of arsenical poisoning, though the case be closely watched in hospital — Lancet Feb 10, 1894, p. 332. In my opinion the points here of interest are —

1. $\frac{1}{2}$ drachms of hydrosiazoic acid were given equal to about $5\frac{3}{4}$ gr arsenious acid.
2. The pain and numbness of muscles.
3. The fever.
4. The onset - legs first complained of after throat.
5. Total absence of knee reflex.
6. The wasting of the muscles.
7. And although not mentioned it was probably the extensors chiefly giving drop foot.

How I should like to quote what Oliver says.

The arsenical neuritis is not common, only a single instance of it has come under my knowledge. No case has followed the use of Fowler's solution in my ward or dispensary practice, although I am in the habit of giving in chorea and anaemia large doses, which might
be considered excessive. The most common causes, are accidental poisoning, as in the cases reported by Mills. In a case E. G. Cutler the patient lost the arsenic from green paper tags, which he was in the habit of putting into his mouth. The general symptoms are not unlike those of alcoholic neuritis; the weakness of the extensors is marked, and the steppage gait characteristic.  

Gowers mentions two cases reported by Dr Costa in Phil. Med. Times 1881, one in which severe symptoms were produced by the medicinal administration of arsenious acid, and another in which they resulted from Fowler's solution, but this was from in increasing doses up to 3/4 N. S. He goes on to say, “The nervous symptoms produced by arsenic resemble very closely those that are caused by alcohol. They are of two classes: 1st. A palsy of the muscles of the limbs, especially the extensors of
the hands and feet,
2nd a "pseudo-tarso" ataxy with defective sensibility especially of
the muscles. The symptoms occur
as a result of chronic poisoning
in small doses; or as after the
effects of acute poisoning, and
they may be the sequel to acute
symptoms produced by the
cumulative effects of small doses.
Thus in one case of attempted
suicide by arsenious acid, the
acute symptoms passed away,
and a little time after their
cessation, the nerve symptoms
commenced. In one case the
interval was a fortnight, another
three weeks, and a third was four
weeks. In one case of Dana's the
ataxy commenced about the 6th day
from the acute poisoning.
The paralysis in the arms has
the same distribution, as that
produced by lead poisoning,
but the sensory symptoms are
more pronounced. There are
usually severe darting pains
in the arms and legs, and
diminished tactile sensibility.
especially on the backs of the forearms, and the fronts of the legs. It may be accompanied by some increased sensiveness to pain. Aatrophy of the muscles occurs very rapidly. The electrical irritability presents the same degenerative changes as other palsies, but in very severe cases the voltage irritability may quickly fall below normal; the knee jerk is usually lost. Sometimes other muscles are involved, those of the upper arm and thigh, but not to the same degree as those of the extremities. Arterial ataxy seems to be of less frequency, than muscular paralysis. It is present in one of the cases described by Steligmüller, and two well marked cases are described by Dana (Dana brain volixp. 115). It resembles closely the incoordination of tabes, but develops in a much more acute manner, and is accompanied by considerable muscular weakness. Severe pains attend the onset, and there subjective sensations, pinnication, tingling, etc. The sensibility of the muscles is
lost, and so as a rule is the knee-jerk; in Seeligmüller's case it was not lost. Cutaneous sensibility may be diminished in places, or may be preserved, and the sensibility to pain may be greatly increased. In one of Seeligmüller's cases was optic neuritis (Gowers vol II pp. 385-16).

He goes on to say that no autopsies have been made, but the close analogy to other forms of toxic paralysis, leave no doubt that the symptoms are due to a peripheral neuritis. He also mentions various skin affections as occurring.

The pathology of this disease is more often obscure, as it is very rare to have an autopsy. As the disease does not kill, and it is only some other disease causing death during this condition that would enable observers to find the actual state of the peripheral nerves and cord.

I have found the following account of a case, one of two cases of peripheral neuritis following acute rheumatic fever by Prof. W. Sleicher and of another observed by Prof. E. J. J. Smith and Neubauer. One recovered, and the other died of
Phthisis. This account of an autopsy made on this case and recorded in a number of Neurologisches Centralblatt 1872.

The two cases had the same similarity: starting with irritability of the parts intestinal tract, then general weakness followed by paresis of the extremities with atrophy of the muscles, then contractures in electrical irritability, and sensory changes. In one case mental disturbance.

The patient improved after two years. She then died of phthisis in the course of a year. There was found a degeneration of the peripheral nerves, together with changes in the anterior horns of the spinal cords, especially in the lumbar and cervical enlargements.

The function cells were reduced in number, and those that remained were altered in shape and size; whilst the protoplasm in parts was replaced by fibrin. The processes of the nerve cells were deficient in part, and some of the cells contained vacuoles. The nerve fibres also in the anterior...
Horns were reduced in number.
Professors Ehrlich and Rybalkin
argued the alteration in the cells in
such conditions, as being due, not
so much to the direct action of the
poison, as to the mechanical alter-
ations in the circulation, and
physiological and chemical
peculiarities in the blood. (Anat.
Nov. 1893).

In this condition it is almost certain
that effect of the poison is on the
peripheral motor nerves, and it depends
on the severity of the case, how far back
the nerve becomes affected.
The atrophy of the muscles is not
caused by the direct action of the poison
in all probability, but indirectly by
the nerve supply being interfered with.
The change in the nerve probably
starts as in lead palsy; by a change in
the medullary sheath, which becomes
narrowed, cloudy and familiar. The axis
cylinder at first remaining intact.
Then probably the next change is
similar to a descending degeneration;
The nuclei undergoing degeneration
and the axis cylinder breaking up
The nuclei and protoplasm becoming
increases, and the products accumulating in masses of ganglionic and granular corpuscles.

The main difference between the arsenical and the lead trujj, that it is permeated across which are affected first, in arsenical, while it is the muscullo spinal in lead.

The condition in the cord seems to correspond very much with that sometimes seen in cases of chronic lead poisoning. Except that the lumbar enlargement is affected in arsenic while it probably escapes in lead, or rather I should say has not been noted, while the implication of the cervical enlargement is noted in both.

Atrophy of the ganglion cells has been frequently noted in lead, as it was in the only case I have a record of. How I should like to turn up a few facts concerning the cases I have put before you.

17. The quantity administered.

1st case. about 31/2 = 6 lbs arsenic
2 = 3 10 = 5 1/2
3 = 3 1/2 = 5 3/4
4 = 3 3/2 = 6 3/4
5 = 3 1/2 = 6 1/2
This shows that it is possible for 5 ps of arsenious acid administered over a period of one week to produce this condition. How much less it would have required is impossible today. How the symptoms in order are:

1st. Gastric intestinal irritability nauseate.
2nd. Skin eruption, occasionally.
3rd. Absence of knee reflex.
4th. Fever, especially severe cases.
5th. Sensory disturbances, tingling pain, etc. in nearly all cases.
6th. Pain on deep pressure.
7th. Muscular weakness, with foot drop.
8th. Lwit drop.
9th. Atrophy of extensor muscles.
10th. Reaction & Paralysis.
11th. Reactions of degeneration & secretion.

There harkettes 8 & 9 as it impossible today which comes first. It is my impression that the knee jerk shows first the effects of the poison.

In the above symptoms 1, 3, 5, 6, 7, 8, 9, 10, I consider are present in all cases. The others may, or may not be.

It is well to note the foot drop is first. The condition is very much like the
arthritis set up by lead, alcohol, silver, sarsaparilla, of which the symptoms as described by W. Pettitt in the Lancet March 26, 1892, are very similar.

In the treatment of rheumatism many drugs have been largely advocated, and it not to be wondered at, as no doubt, many cases have been supposed to have been cured by them, which would have got well by self alone. How the drugs most recommended have been arsenic, quinin, sulphate, strychnine, strychnin, salicylates, and others.

How arsenic alone seems to master those severe or chronic cases which apparently resist all other treatment, and it is therefore all the more necessary that we should be able to recognize. That in the first place, there is a danger of this arthritis following, and so be prepared to be on the watch for the first symptoms which would lead us to suppose that enough of this drug has been given, and in the second place, to recognize that there is a method of giving this drug in an equally efficacious,
though perfectly safe manner. I should like to quote the words of St. Aquin in this—

He says: “Our Manasik in the treatment of Chorea is still arseneic.

I have long taught, that one reason why the medicinal treatment of Chorea has seemed of little utility and why a belief has grown up that the disease might terminate spontaneously or only with the help of physical forces abut—as quickly as when strong drugs are used. It is because physicians almost without exception, for nearly useless doses of arsenic. Case after case has come to me pursuing its irremediable or positively chronic course, while the patient was taking from 6 to 70 minims of Foote’s solution. I have satisfied myself that Chorea can be greatly shortened by the proper exhibition of arsenic, but that to obtain a striking result it is necessary in most cases to employ 15 in. 7.5. The important point to bear in mind, when after starting with 1/75 and pouring up to 1/12

satisfactory symptoms appear is, that after an interval of rest.
you should begin where you left off, and then go on to the really efficacious doses of from in \( \text{xxv} \) to \( \text{xxv} \) after each meal. Few cases in my opinion show much improvement till in \( \text{xxv} \) or \( \text{xxvii} \) T.S. has been attained. In the case of arsenic, even more than in that of iodides, the necessity for a large volume of alkaline water should be borne in mind. Another error in practice is to make the patient drink the dose at once. There is no necessity for this; and it is much better borne if taken in divided doses during the hour following the meal. As regards the evil effects of arsenic, I have only once in my experience found albumen or casts in the urine of chronic patients, even when their eyes are cloudy. In this case renal disease had probably set in prior to the chorea. Herpes is said to be an occasional result of the excess of use. I have only had one case in which while a child 12 years old was taking about \( \text{xxv} \) T.S. there appeared a large vesicle on the side of the thumb
which left quite a deep scar. Symptoms of multiple or optic neuritis have never seen from medicinal use of arsenic." He then goes on to advise the great benefit to be derived from rest, and that the arsenic in all cases should be discontinued immediately the movements cease. He is strongly against exercise except in the form of slow and movements thoroughly carried out as slow and steady expansions of the lungs, or slowly raising arms, or touching the toes. (New York and London, April 1893)

There are left only one or two things I should like to mention. One is that it seems an exception to the rule for albumen to be found in the urines. In only one of my cases was it present, even when the paralysis had developed, and in that case it was in all probability post-hoc non-propter hoc.

The other is that any sign of temperature rising should be carefully noticed, and the arsenic left off immediately. As these cases which develop seminal disturbance
seen invariably to be the most
severe and obstinate cases.
I have laid down for myself
Certain rules which I shall follow
and they are.
1st If the case is a primary one
and mild. To put only rest and
see if that will not prove sufficient.
2nd If a chronic or severe case.
To start with

\[
\text{mV T.I.S. increasing}
\]

\[
\text{mT daily until mV ½ reached,}
\]

\[
\text{and not to continue beyond that}
\]

\[
\text{amount T.I.S.}
\]

3rd Not to put more than 4½ mV li.
any case.
4th To keep careful watch on the

\[
\text{knee reflex, and temperature}
\]

5th To always allow an interval
of at least three days, if any

\[
\text{gastric disturbance}
\]

6th To continue from the point
left off at, if cessation requires
for gastric disturbance.

And if I ever have another case
I should treat it in the following
manner.

1st Light massage of the muscles
affected.
2nd as soon as pain had subsided
a mild current of paralysation
3rd administration of pot. iodine
in the hope that it would aid in
elimination in the same way as
d it acts in lead poisoning.

Hope never to have another case
however, and I think by following
the rules as to administration I have
mentioned above, to avoid that
calamity, as prevention is better than
cure, and once the paralysis has
set in it is a long and tedious
matter to get the patient cured.

I certify, that I have received
help from none, and that the
above has been collected by myself,
from my own notes, and from
the authors quoted.

A. Holjandh Foster.