plained of irritable bladder, which had lasted for some ten or twelve months. She passed blood December 1st, 1893, small quantity. April 6th, 1896, again passed blood, and as far as I could find out at the end of micturition and accompanied with burning, smarting pain. She also complained of pain in the right renal region, and upon examination of the kidney it was movable and enlarged. She had chills, and temperature 102.5°. On April 18th it dropped to 100°. The treatment was quinine in full doses. On April 28th I gave her a belt to wear to keep the kidney up. October 1st, 1896, no blood since, but passed two little substances (not hard) like grains of wheat. There was pain in the right kidney, passing down to the groin, but the kidney was smaller and less mobile. February 17th, 1897. She has had pain in the right kidney when she drives, especially when the roads are rough. When she lies down and rests it gets better. The urine was examined several times—result, no albumen. I do not know what was the cause of the hæmorrhage in this case; thought it was malaria, but the pain in the kidney and down the groin negated it, especially as these symptoms continued from time to time.

CASE VII.—J. L., aged 48. Father well at 83, mother died in confinement; five brothers and five sisters in good health, no tuberculosis on either side. On January 6th, 1897, he called upon me, looked pale, complained of frequency and scalding, water abundant and clear. It was not examined and I did not take the temperature. I gave triticum repens and alkalies. In the evening of the same day I visited him and there was considerable hæmaturia, the blood being intimately mixed. On the 7th there was blood again and pain at the end of micturition; temperature 102°. The right kidney was tender, and there was pain running round to front. I gave quinine in full doses. There was albumen in the urine and some pus. On the 10th temperature was 103° and patient somewhat delirious. Warburg's tincture and alkalies were then given. On the 11th, high temperature continuing, quinine and Warburg's tincture were both given. On 13th Dr. McCallum visited him with me. We continued the tincture and the blood disappeared.

CASE VIII.—Dr. W., about 50 years of age, with good personal and family history. He was taken suddenly ill March 10th, 1894, with hepatic colic, followed by jaundice, which lasted two or three weeks. He seemed to be recovering satisfactorily when hæmaturia with frequency and pain occurred, accompanied by chills and fever, the temperature at times rising to 104°, followed by profuse sweats. Quinine in large doses was very properly given by his attending physician but with only partial relief. On April 13th I saw the patient in consultation, and he was much enfeebled from the loss of blood and the prolonged chills and high temperature. As quinine had been faithfully and perseveringly tried I advised large doses of Warburg's tincture, and the patient gradually and steadily improved. To use the doctor's own words, "As soon as I commenced taking the Warburg's tincture I improved rapidly in strength and weight; I lost 50 lbs. while ill and gained half of that."

Hæmaturia other than accidental as a symptom is of more than ordinary importance. Roughly speaking, it means blood from any portion of the urinary tract—kidney, ureter, bladder, or urethra. It is nearly always possible to know from what portion of the tract the blood comes: (a) If from the urethra it may ooze between the times of micturition; (b) if from the neck of the bladder it is more particularly noticed at the end of micturition; (c) if from the bladder, it is usually abundant, more persistent, more likely to clot, and is accompanied by bladder irritability. It is well to remember that it occasionally produces obstinate retention.

Having determined with great care the point from which the blood comes, the more difficult problem lies before the inquirer—the determination of the cause of the blood flow.

In bleeding from the kidney the blood is generally intimately mixed with the urine. When, however, the quantity is large, we have ureteral clots, which I look upon as being highly diagnostic. They are occasionally productive of the same symptoms as stone in the ureter, and the colic continues until the blood is forced into the bladder.

There are cases of bleeding from the kidney, the causes of which are difficult to determine. The symptoms at a certain stage of tuberculous kidney and stone in the kidney have so much in common, that one is wholly unable to determine to which this symptom belongs. In both the hæmorrhage is usually small. The character of the pain is similar, and the quantity of albumen much the same. Repeated examinations of the urine may fail to discover the bacilli.

In the report of these few cases it will be noticed how this point was determined, and the diagnosis of a difficult case made plain, and the treatment properly directed. It is impossible to over-estimate this precise knowledge.

If tuberculous kidney is discovered in the early stage the operation ought to be as successful here as in local tuberculous disease in other parts, an operation ought not to be delayed long. Whereas if it be a case of stone in the kidney the operation could in most cases be delayed without endangering the case, and the operation is more frequently nephrotomy than nephrectomy.

In considering the report of these cases I have grouped them. Nos. 1 and 2 were, in my opinion, undoubtedly malignant, although no *post-mortem* examination was made. When tumour (kidney enlarged), pain, and hæmaturia co-exist, we may feel pretty certain of the diagnosis. Pain was

present, but was not a marked symptom in either, although No. 2 had considerable tenderness over the kidney from the time of my first examination. Emaciation and cachexia towards the end of the disease were well marked in both. Both passed ureteral clots. Several of them rolled up together, looked much like a bunch of earth worms; this alone is fairly diagnostic. Chills and fever were present in both cases, and both passed more than the normal amount of urine in 24 hours. In No. 2 the temperature three days before death ran up to 104.4° F., this condition was probably due to local septic causes.

No. 3 was tuberculous, and the report of the manner in which the diagnosis was established requires no comment from me.

The report of the inoculation and the cautions necessary in making it I have given in the words of the doctor who made the inoculation.

Causes 4, 5, 6 (?), 7, and 8 were in my opinion malarial. I now regret that the blood was not examined for the malarial "parasite."

But the fact that quinine or Warburg's tincture produced a termination of the hæmaturia, and a speedy return to health is important. Some authors speak of transient hæmaturia—not depending on any cause (perhaps it would be better to say any discoverable cause), and might assign these cases to this class, but the manifest improvement in these cases under the influence of drugs which are designated as specifics in the treatment of malaria must have considerable weight in the determination of the cause.

Case No. 6 I marked with a note of interrogation, as she had movable kidney and symptoms continuing after the attack which might point to stone—notably the tendency to pain in the kidney when driving over rough roads, and the relief of these symptoms when a recumbent posture was assumed. As she lives a long distance from town I see her only occasionally, but at no time after recovery from the attack of hæmaturia has albumen been detected in the urine.

I would suggest, therefore, in all cases of recent hæmaturia where the diagnosis is doubtful, and where there have been chills and fever, or where there has been a simple elevation of temperature, that Warburg's tincture should be tried.

A CLINICAL LECTURE

ON

THE TREATMENT OF DIPHTHERIA.

By JOHN HERALD, M.A., M.D.,

Professor of Clinical Medicine, Queen's University, Kingston, Ontario; and Physician to Kingston General Hospital.

THE etiology of diphtheria I do not intend to discuss, merely stating that I concur in the now almost universally accepted opinion that it is primarily a local disease due to the presence of a specific germ, and secondarily a constitutional disease, the constitutional disturbances being occasioned by the absorption from the local focus of a chemical poison or toxin generated at the seat of infection by the bacilli diphtheriæ. This toxin may, and frequently does, affect distant organs, and so we may have during the course of diphtheria intercurrent diseases or complications. In this way the heart, the lungs, the kidneys, the nervous system, may be seriously affected. The treatment, therefore, has three objects in view: the destruction of the bacilli at the point of infection; the neutralisation of the absorbed toxin; the combating the complications as they arise.

Such has been the mode of treatment adopted by myself and other physicians here. To illustrate I will give a synopsis of 100 successive cases treated in the Kingston General Hospital from October 1st, 1896, to March 31st, 1897. These cases were not all attended by myself, but as I have the records of all these cases before me, I will make use of them. In this hospital a patient who can afford to pay for a private ward is allowed to employ his own physician, while all who go into the public wards are placed under the care of the attending physician. For this reason these 100 cases of diphtheria were attended by different physicians, 36 coming under my care as

physician to the hospital, and the remaining 64 being distributed among twelve of my *confrères*.

I will now give a synopsis of these 100 cases, and then point out the mode of treatment adopted:

One Hundred Successive Cases of Diphtheria treated in the Kingston General Hospital from October 1st, 1896, to March 31st, 1897.

Males	...	...	...	...	33
Females	...	...	...	...	67
Total					100
Under 1 years of age	...	...	...	...	1
Over 1 " up to 5 years of age	...	...	...	...	33
" 5 " " 10 "	...	...	...	...	30
" 10 " " 15 "	...	...	...	...	11
" 15 " " 20 "	...	...	...	...	7
" 20 " " 30 "	...	...	...	...	12
" 30 " " "	...	...	...	...	6
Total					100
Location of Membrane.					
Tonsils	...	...	...	...	86
Pharynx	...	...	...	...	24
Larynx	...	...	...	...	15
Uvula	...	...	...	...	11
Nose	...	...	...	...	5
Mouth	...	...	...	...	2
Tongue	...	...	...	...	2
Total					145*

* This total (145) is explained by the fact that in a number of cases the membrane was deposited upon more than one of the above-mentioned locations.

Days Ill before Admission to the Hospital.					
One day	...	...	...	...	29
Two days	...	...	...	...	38
Three "	...	...	...	...	18
Four "	...	...	...	...	7
Five "	...	...	...	...	4
Seven "	...	...	...	...	3
Twelve days	...	...	...	...	1
Total					100
Intubations	...	...	...	...	12
Deaths	...	...	...	...	None.

In all of these cases the diagnosis was made clinically, but in all cases of doubt this diagnosis was confirmed by a bacteriological examination by Dr. W. T. Connell. No doubtful case was classed as diphtheria unless the bacilli were actually found.

TREATMENT.

1. *To Destroy the Germs at the Seat of Infection.*—As these cases were treated by a number of physicians a variety of local applications were employed. These local applications consisted of the following: Peroxide of hydrogen, tincture of the muriate of iron, sodium bicarbonate, carbolic acid, iodine, potassium chlorate, bichloride of mercury. In the intubation cases calomel was employed by sublimation. As all of these patients recovered no matter which of the above mentioned drugs were used, two conclusions might be drawn, namely, either all are equally good or the patients' recovery was not due to the local application but to the other treatment adopted. I am of opinion that a local application is of service and that the requirements of such an application are that it be non-irritating and capable of destroying or impairing the activity of the bacilli. If, as is now generally conceded, the constitutional symptoms are due to the toxin generated by the bacilli, then anything which lessens their vitality ought to decrease the amount of toxin generated. For this reason I am favourably disposed towards a local application. As I have used it for a number of years with gratifying success I am disposed to prefer a solution containing potassium chlorate, tincture of the muriate of iron, glycerine, and bichloride of mercury solution (1 to 4,000).

2. *Constitutional Treatment.*—Here all are a unit. All use antitoxin. Each of these 100 patients on admission was given hypodermically antitoxin. The dose in nearly every case was 1,000 units; only 4 received less, and of these 2 received a second injection, thus bringing the total amount administered in each case up to the 1,000 units. Sixteen of these patients received 1,000 units on admission and afterwards a second injection of 1,000 units, and one received the third 1,000 units. As these patients did not make a more favourable progress than did those who received only the first 1,000 units it would appear as if a dose of 1,000 units is all that is required.

Another point to be noted in these cases is that under the antitoxin treatment not only were the constitutional symp-

toms lessened in severity, but the spread of the membrane appeared to be checked, and what had already formed was more quickly dissolved and removed. Possibly the explanation of this is to be found in the fact that, as the poison in the system is neutralised by the antitoxin, the various tissues of the body retain their vitality to a greater extent, and thus have a greater power to resist the invasion of the bacilli. It may, I think, be accepted as an axiom that the lower the vitality of the tissues the more liable to infection the organism, and, conversely, the greater the vitality of the tissues the greater the power of resistance, and the less the liability to infection. If this be true, and if antitoxin has, as I believe it has, the power of overcoming the evil effects of the diphtheritic poison upon the organism, then the action of antitoxin is directly constitutional and indirectly local.

I would now mention a few points regarding the injection of antitoxin and its effects. With us the injection is always made into either groin, and we prefer to inject the full amount at one time, using a syringe which holds 1,000 units. Usually within a few hours after the injection the temperature was found to rise slightly—never more than 1° F. Frequently there appeared around the point of injection a rash closely resembling that of scarlet fever. This rash would cover a circular space of 3 or 4 inches in diameter. The only inconvenience occasioned by it was that the patient would complain of it being itchy. In four of these cases this rash extended over the whole body, and then presented an appearance somewhat between that of scarlet fever and that of measles. I am of opinion that this rash is occasioned by some impurity in the antitoxin solution. Latterly we have not had this rash in our cases.

It might well be asked is this antitoxin curative, or, in other words, has it the power of neutralising the poison absorbed from the seat of infection? Here we have a record 100 successive cases without a death. I am well aware that this number is too small to decide the question. But, be it remembered, as stated above, that the local treatment differed according as the patient was treated by one or another of thirteen physicians. The injection of antitoxin was the only mode of treatment adopted by all. Would anyone of the local applications made in these 100 cases have produced the same gratifying results? Past experience in this disease emphatically answers No. If not, to what can we attribute our success? In my opinion, to the antitoxin. Would I, then, discard local applications entirely? By no means. As I have already stated, I favour the use of these topical applications, believing, as I do, that by them we impair the activity of the bacilli, and thus prevent the generation of the toxin in as great quantity as would happen were these applications not made.

3. *The Treatment of Complications and Sequelæ.*—Under this heading we have such conditions as weak heart, bronchitis, pneumonia, albuminuria, paralysis. The treatment of these will be that that would be adopted if these were the initial disease, with, perhaps, this difference, that the patient is already more or less exhausted by the diphtheria, and, in consequence, a more stimulating mode of treatment becomes necessary.

Another condition which may arise during the course of diphtheria is partial stenosis of the larynx due to the formation of the membrane in that situation. Here the treatment will be either tracheotomy or intubation. As Dr. J. C. Connell of this city, who has had experience in intubation, is to supplement my notes on these 100 cases by some observations upon this operation I will not discuss it, feeling that it will be much better dealt with by him than I could hope to do.

Prophylactic Use of Antitoxin.—Another use has been made of antitoxin; it has been employed as a prophylactic. I have not had much experience of it as a means of preventing the spread of diphtheria. I have inoculated 12 children from whose families one member had been removed to the hospital suffering with diphtheria. None of these children became infected although the infected member of the family had freely mixed with the others before I saw him and had him removed. In other cases, where inoculation was not practised, several members of the same family became infected. The dose that I used for inoculation was 500 units. I give these figures not because I think they are conclusive, but in the hope that others who have tried inoculation may

supplement them, and thus from the sum of the experience of many this important question may be decided. If, as my limited experience seems to indicate, antitoxin by inoculation has the power of preventing infection, then assuredly has this disease been robbed of much of its terror.

THREE CASES OF FRIEDREICH'S DISEASE ALL PRESENTING MARKED INCREASE OF THE KNEE-JERK.

By GEORGE HODGE, M.D.,

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FAMILY HISTORY.

THE father, aged 72, is living, and has always enjoyed excellent health, except that during the last fourteen years he has suffered from eczema of the legs, which has produced such a condition as to necessitate the use of crutches in locomotion. The mother died three years ago, aged 70, of what was supposed to be cancer of the liver, after an illness of four months. Previously to her fatal illness she had always enjoyed good health. The father and mother were first cousins; both temperate and free from any syphilitic or tuberculous history.

There were eight children in the family, three boys and five girls. The two eldest (boys) died of scarlet fever in childhood; the remaining six are still living, three of whom form the subject of this paper—two females and one male. Of the other three, one, aged 41, is married and is the mother of six children, the eldest of whom is 16 years and the youngest 2 years. The mother and children are all healthy. A second one, aged 37, is also married, and is the mother of one child, aged 18 months; both mother and child are healthy. The other sister, aged 42, is unmarried, and is said to be strong and healthy.

Careful inquiry elicits the fact that, with the exception of the three whose cases are about to be described, there is no relative who has ever had deformity of the feet or any peculiarity of gait.

CASE I.—M. W., unmarried, aged 44, is the eldest of the family living. When between 3 and 4 years of age she fell down stairs and injured her back, after which she was never so active on her feet as other children of her age, and had a peculiarity of gait. She went to school till she was 12 years of age, then helped with house work for seven or eight years, during which time the difficulty in walking gradually increased, till at the age of 20 she was unable to walk without supporting herself on some stationary object or objects. At the present time she cannot even stand without support. On attempting to do so she sways backwards, forwards, and from side to side, and would fall forward if left to herself. She stands equally well with eyes closed as with them open.

There is the characteristic deformity of the feet, which is very well shown in the accompanying cut. (Fig. 1.) There

Fig. 1.—Case I.

is not much wasting of the lower extremities (not more than can be accounted for by disuse). The muscular power is somewhat, but not greatly, impaired.

There is neither ataxia nor tremor of the upper extremities.

The muscles of the thenar and hypothenar eminences and also the lumbricales and interossei are atrophied, and the hands tend to assume the "bird-claw" shape. There is no tremor of the head. Lateral curvature of the spine is quite marked. Horizontal nystagmus is a well-marked symptom when the patient fixes on an object at either side. The pupils react normally both to light and accommodation. The visual field is not contracted. There is no dyschromatopsia.

Tactile sensibility, sensibility to pain and temperature, and muscular sense are all normal. The patellar reflex is markedly exaggerated on both sides. There is no ankle clonus; the plantar reflex is increased. The mind is unaffected, the patient being quite as intelligent as most people in her station in life. A slight change in speech is noticeable; it is slow and drawing.

The patient began to menstruate when 14 years old, and has continued to do so regularly till within the last six months.

CASE II.—S. W., aged 40, unmarried, attended school till she was 14 years old. She remembers that before she left school she had difficulty in walking, which she attributed to the fact that her boots hurt her feet. She was unable to get ready-made boots to fit her, in consequence of which she was taken to a shoemaker, who said that he would require to get special lasts made upon which to make her boots. There can be no doubt that the deformity of the feet existed prior to this. Even after she got boots to fit her she continued to have difficulty in walking, and this difficulty has steadily increased till at the present time she is unable to walk without the aid of both a cane and a crutch. She cannot rise from the sitting posture without aid, and when standing, if left to herself, she begins to sway about and would fall forward and to the left. She says she can stand better with her eyes open than with them closed. In walking her body is thrown forward and to the left, her feet are merely lifted off the ground (shuffled along the ground), she brings the anterior part of her feet to the ground first. The lower extremities are very well developed, but the muscular power is impaired, especially on the left side.

The feet are characteristically deformed, to a greater extent than Case I but to a less extent than Case III (see Fig. 2). There is no ataxia nor tremor of the upper ex-

Fig. 2.—Case II.

trémities. The hand grasp is much weaker than it should be, although the hand muscles are not atrophied as in Cases I and III. She can sew and knit, but says that she has noticed that if she attempts to cut out a garment the cut edge is zig-zag instead of straight. There is no tremor of the head. There is slight lateral curvature of the spine, not so marked as in Case I.

Horizontal nystagmus is evident when the patient fixes to either side. The pupils react normally to both light and accommodation. There is no contraction of the visual field. Tactile sensibility, sensibility to pain and temperature, and muscular sense are all normal. She says that the lower extremities feel numb, especially if they are cold. The patellar reflex is distinctly increased on both sides; the plantar reflexes are present but are not increased. Intelligence is unaffected. Her speech is affected, as indicated by the fact that her friends complain that when she talks they