Single Ovariectomies.

No.	Date.	Imme- diate Result.	Ultimate Result.
1	1888	Excellent	Health very good.
2	1888	"	Returned with ventral hernia in 1895.
3	1893	"	"I have not had good health; never free from pain, especially in the lower part of my back."
4	1894	"	"I have had very good health since my operation."
5	1894	"	Very good health: earns her living by mangling.
6	1894	"	"I have no pain, but much general weakness, which makes one think of all kinds of imaginary diseases."
7	1894	"	"Since my operation I have had very good health."
8	1894	"	Much better since operation.
9	1894	"	"My health has been fairly good."
10	1895	"	"I have enjoyed the best of health since my operation."
11	1895	"	Has had excellent health since operation.
12	1895	Thrombo- sis of veins of left leg	"I am fairly well in health, but my leg still troubles me very much."
13	1895	Excellent	"I have had excellent health since the operation."
14	1895	"	Health excellent.
15	1895	"	A second tumour has formed.
16	1896	Thrombo- sis of veins of leg	Health excellent.
17	1896	Excellent	"My health has been quite good since the operation."
18	1896	"	Good health since the operation; birth of healthy child 9 months ago.
19	1896	"	Health before operation poor; now health excellent; 7 months pregnant.
<i>Double Ovariectomies.</i>			
20	1892	Excellent	Excellent health since 1893.
21	1893	"	"I have had great relief since the operation, but I am not very strong."
22	1893	"	Died of cancer of the uterus in April, 1894.
23	1894	"	Has occasional numbness down the left side.
24	1895	"	"My health has been fairly good, and I continue to get stronger. I still have hot flushes rather frequently."
25	1895	"	Health excellent.
26	1896	"	Suffers from constipation, asthma, and occasional flushings.
<i>Salpingitis and Ovaritis.</i>			
27	1893	Excellent	"I have had years of life and freedom from pain from the agony I endured."
28	1893	"	"Owing to the splendid operation I have been quite cured."
29	1894	"	General health fair.
30	1894	"	"Before operation never free from pain; now no pain."
31	1894	Prolonged convales- cence.	"I still suffer very considerably from weakness in the abdomen."
32	1894	Excellent	Very good health now.
33	1894	"	Excellent health.
34	1895	"	Continued pain. Second operation, when left ovary was found bound down by adhesions; this was rejected. The pain continued, and as further operation was not advised, patient went to another hospital, where she was operated upon and died a few days later.
35	1895	"	"I now enjoy very good health."
36	1895	"	"Since the operation my health has much improved."
37	1895	"	In excellent health.
38	1895	"	"Since my operation I have enjoyed very good health."
39	1895	"	Health good but pains in head.
40	1895	"	Excellent health.
41	1895	"	General health fair.
42	1895	"	"My health is much better. I am growing quite stout."
43	1895	"	Has attacks of sickness, with headache and feet swell.
44	1896	"	General health fair.
45	1896	"	General health excellent.
46	1896	"	"I am better than formerly."
47	1896	"	General health good.
<i>Abdominal Hysterectomy.</i>			
48	1893	Excellent	"My health was weak for two years, but now I am in good health, and am manageress in a busy hotel."
49	1893	"	General health fair.
50	1894	"	"I have better health now than I had for six years before the operation."
51	1894	"	Never feels well; worries about nothing.
52	1894	"	"My general health is fairly good."
53	1894	"	"Since the operation I have been perfectly well."
54	1895	"	"The operation was most satisfactory in every way. My health has been quite good since."
55	1895	"	General health good.
56	1896	"	"I feel very well indeed."
57	1896	"	Health good. Works hard in the Salvation Army.
58	1896	"	Health excellent.
59	1896	"	General health good. Returned with ventral hernia in 1897.
60	1896	"	General health poor. Much pain in back.

No.	Date.	Imme- diate Result.	Ultimate Result.
61	1894	Excellent	<i>Fibro-cyst of Uterus.</i> "I think my operation has been fairly successful, though I am not very strong."
<i>Exploratory Operations.</i>			
62	1894	Excellent	Excellent.
63	1894	"	Has been in very good health since the operation.
64	1895	"	Died in 1897. Cause unknown.
65	1895	Not relieved	Died of bronchitis a year later.
66	1896	Excellent	General health good.
<i>Hysterectomy.</i>			
67	1895	Excellent	"Since my operation my general health has been good."
68	1895	"	Excellent health. Birth of boy 3 months ago, excellent recovery.
69	1896	"	"I have not had so much pain, but I have not felt so strong."
70	1896	"	"My general health has much improved."
<i>Cæsarean Section.</i>			
71	1895	Excellent	"I feel as well now as ever I did in my life."
72	1895	"	Readmitted in 1896 for abdominal hysterectomy.
<i>Cyst of Corpus Luteum.</i>			
73	1894	Excellent	Health excellent.
<i>Umbilical Hernia.</i>			
74	1894	Excellent	"Excellent till the last four or five months, when I have had some abdominal pain."
75	1895	"	"The operation was quite successful."
<i>Various Causes.</i>			
76	1892	Protracted convales- cence	Readmitted in 1897 with acute intestinal obstruction; died soon after admission.
77	1892	Excellent	Health better than for six months prior to operation, but cannot say it is good.
78	1894	"	Health good.
79	1894	"	Had a second operation at another hospital a year later.
80	1894	"	Health excellent.
81	1894	"	Excellent health.
82	1894	"	"My health is very good."
83	1895	"	"My health has been quite as good since the operation."
84	1896	"	Excellent.
85	1896	Malignant of perito- neum	Died 3 months later.
86	1896	Excellent	General health very good.
87	1896	"	Excellent for one year, then contracted gonorrhœa, and developed double pyosalpinx. Operated on at Charing Cross Hospital, 1898.
88	1897	"	Health excellent.

ON LATERAL CURVATURE OF THE SPINE: ITS
PREVENTION AND TREATMENT.By RICHARD BARWELL, F.R.C.S.,
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II.

In a previous communication on this subject¹ I defined four forms of pelvic deviations, pointed out their diagnosis, and ended with a strong recommendation—almost had I written exhortation—to watch lest the youth of either sex adopt one or other of these malpostures. On these same lines I must go a little further. The spine has for its basis the pelvis; every movement of which, even though momentary, is accompanied by a compensating change in position of vertebræ; were this not so we could neither walk, run, ride, or take any sort of active exercise, because without that adaptability of the spine, the body's centre of gravity could not be shifted from side to side, backward, or forward, so as to lie over the constantly changing point of support on the floor or saddle. That is to say, when in any of these exercises the pelvis assumes for a time an oblique, a sideways, or twisted position, the spine must during that time so curve or rotate as to adapt itself to the temporary posture of its base. If, however, such posture be not merely a momentary but a permanent condition, then that curve or rotation of the spine will be equally persistent. Therefore, if a child or adoles-

cent acquire a habit of standing or sitting with the pelvis awry, as in the illustrations to my last paper, the corresponding curve or twist of the spine, intended only as a temporary and alternating attitude, becomes a constant or almost constant position, followed later by the muscular and ligamentous changes, already more than once alluded to, which fix and render so recalcitrant the later stages of scoliosis.

This is the genesis of by far the larger number of lateral curvatures; the exceptions will be mentioned in the sequel. What, however, I now desire strongly to accentuate is, that given such intelligent care as shall detect the various pelvic deviations in their early commencement, spinal curvature can be prevented; in more technical surgical language there is a prophylaxis of scoliosis, one that with a little assiduity and a sufficient comprehension of the malpostures to be combated succeeds within a reasonably short time. I propose now to examine these different measures as applicable to the four modes of pelvic deviation.

Permanent Pelvic Obliquity (see Fig. 1 in my previous paper) is, in the absence of joint disease, a passing attack of infantile paralysis, or some form of talipes, the result of defective growth at one of the epiphyseal junctions generally of the lower, femoral one. The deficiency or sluggishness of increase may originate from a blow or fall so slight as to be overlooked or forgotten yet sufficiently severe to derange the nutrition of the proliferating cartilage.² More frequently the irregularity is due to an unexplained idiosyncrasy of growth analogous to that which in some persons causes the nose to sit sideways on the face; in such cases it nearly always happens that the limb which grew quickest ceases to grow first, and thus at the period when the epiphyses join the length of limbs becomes even. While the defect lasts, however, its influence on the spine must be obviated by adding one, sometimes two, thicknesses of leather to the heel of one boot, right or left, according to which limb is the shorter; also by the use of the sloping seat for two or three periods of about twenty minutes daily. A permanently oblique pelvis connotes a different angle between the transverse axis of the pelvis and the two thighs, that on the longer side being the more acute. A slight inequality in these angles is not productive of evil; but when the difference of length of limb is pretty strongly marked, the above described angle, therefore, much diminished the adductors of the thigh are very apt to become shortened, a condition likely to interfere with subsequent rectification. This complication may be thus prevented. Let the patient stand in drill posture, but with the arms akimbo, then with knee straight and with toe pointed directly forward, thus avoiding outward rotation of the thigh, the shorter limb must be thrown straight outward as high as can be managed.

Habitual pelvic obliquity (see Fig. 2 in previous paper) is a trick which those continually with the child can, when the defect has been pointed out, correct; a task which the surgeon must in the nature of things delegate to them. It only requires watchfulness and strict, perhaps even stern, injunction. Should the droop of one side of the pelvis be strongly marked and constant, the patient should be made to reverse it; that is, if he be in the habit of using continually for ordinary station the right limb, he should be made to stand for a certain time on the left one, letting the right instead of the left side of the pelvis droop. The place of the unemployed right foot on the floor is important if only the remedial pelvic obliquity is contrary to the habitual one; for this same object the sloping seat may also be used. The number of times per day, and the length of each period, must depend on the degree of usual pelvic droop, the bodily strength, and general conditions of health. We must not overlook the fact that the position with the one knee in front and slightly crossing the other may be assumed by an adolescent girl to ease pain due to ovaralgia or congestion with dysmenorrhœa or amenorrhœa; such posture therefore should suggest questions to her mother. Girls with or without these troubles often, though by no means invariably, stand with the unemployed knee in front of and somewhat crossing the other. No girl with that form of obliquity, whether habitual or permanent, which consists in a droop of the left side of the pelvis, should be permitted to ride on horseback in the usual position; namely, with the right knee in the pommels. If the obliquity be strongly marked, she must ride on the other side of the horse, the left knee in the pommels. In less

marked cases, or when the above method has had sufficient effect on pelvic malposture, she may alternate, using one day a right-handed and the next a left-handed saddle. Indeed, if a girl be growing rapidly, and be at the same time somewhat anæmic, it is wise even if she have no pelvic deviation to let her thus ride alternately on right and left side of the horse.

Amesiality of the pelvis (see Fig. 3 in previous paper) is more difficult of correction, for so perverted does the patient's neuro-muscular sense, after a little persistence in this attitude become that to her the one-sidedness appears straight, while if the surgeon with his hands arrange the figure into a straight position she feels excessively crooked. The most important point in the correction of this aberration is a change of the patient's neuro-muscular sense of balance. I effect this in the following manner: a mirror is so placed in front of the patient that she sees her reflection from the neck down to below the umbilicus. In dealing with children the whole figure should be stripped, but in the case of adult girls there is no need for complete nudity; the device can be demonstrated simply on the upper part of the figure. Arranged thus, I place a plumb line at the centre of the episternal notch, cause her to hold it there with a finger tip, and show her how, in consequence of pelvic amesiality, the cord falls to one side of the xiphoid cartilage and of the umbilicus; with children, also, of the pubes and knees. I then with manual pressure on the prominent side of the pelvis and on the side of the chest, just below the axilla straighten the figure; show her then how the cord falls over these median landmarks, and beg her to study well her sensations and thoroughly to imbue her

Fig. 5.—Wall exercise for right pelvic amesiality.

mind with the sensation of rectitude. I then ask her to procure a plummet, with about 4 feet of cord, to go through the exercise in front of a sufficiently large mirror every morning before putting on her clothes; to observe that the cord lies centrally on all parts of the body, from the top of the sternum to below the knees, and to acquire a mental and bodily habit of the straight position. A valuable aid is the lateral sling; the patient with amesiality to the right—the most common of this malposture—lies with the right hip in the webbing loop, the thighs should be somewhat, but not irksomely, ex-

tended, the head, but not the shoulders, supported by a pillow. Recumbency in the sling may take place on a rather firm sofa, or, failing that, upon a rug on the floor. In this position the patient can read or learn by rote. A more efficacious remedy, to which I must hereafter again allude, is what, for want of a better name, I have termed the "wall exercise" (see Fig. 5). The patient stands with the right side to and the shoulders at a right angle with the wall (still taking right amesiality as the type), places that foot (heel and toe) against it; then, to get the arm out of the way, she puts her hand near the coracoid of the opposite side. Her mother, or other helpmeet, now takes a block of wood, or a book about 2 inches thick and 5 long, and, according to the stature of the patient, from $2\frac{1}{2}$ to 4 inches broad. One of the long sides should be rounded. She places this block with the rounded side midway between the great trochanter and the crest of the ilium, then, placing her hand on the patient's side, about where the cross is drawn in the diagram, she upholds the figure while the girl places her left foot (heel and toe) against the right one. The exercise is not to be done nude, but before the stays or much clothing is put on in the morning; it may be repeated in the evening, and, if the stays be slight without bones or steels, also in the middle of the day. The position cannot be maintained more than three minutes at first—after a little practice, for five.

Fig. 6.—Left version of pelvis.

Version of Pelvis.—This hitherto unsuspected position is very much more common than when I first noticed it. I could have imagined, and permission must be granted me to break away for a few minutes from the subject of treatment in order to complete the short description given (Fig. 4, BRITISH MEDICAL JOURNAL, January 21st, p. 138) in my former paper. The illustration showed a strong example of the twist, but the condition was combined with amesiality and an advanced curvature. That particular figure being chosen in order to show how the spinal condition follows on and is caused by the pelvic aberration. Yet in order the better to demonstrate that latter defect it seems well to show it while as yet it is an isolated or almost isolated fault, Fig. 6 is

thus chosen. The girl though developed is not yet 14 years old; for some five months her parents have suspected that something was wrong with her figure, but she was only brought to me a week or two ago. The pelvic version was at once evident, and is well seen in the annexed photograph. The arrangements for securing a correct rectangular position of camera to patient were given in a previous communication.³ Succinctly recapitulated, they are these: By means of tapes and cords an accurate isosceles triangle is mapped out on the floor; the patient stands on the base line with its middle point between the heels; at the centre of the lens is the apex. The image must be made to fall on the middle of the ground glass. Thus the line of sight from the lens to the patient's heels must be accurately at a right angle to what should be the transverse plane of the patient's body, if—and this is the vital point—that body be not twisted. The photograph of a straight figure does not show one side more than of the other of pelvis, loin, or back, that is to say, there is an equal breadth of the body to right and left of the middle line.

But if this illustration be examined and the distance between the rima natum and the side outlines right and left of the pelvis be measured with compasses, the breadth on the left side will be found to be very much greater (three-sixteenths of an inch) than that of the right. This is not due to any deformity of the pelvis itself, but simply to the fact that the patient so twists that part of her body that the left side is slewed backwards and presents to the eye or to the camera lens a considerable part of its side surface, while the right, situate too far forwards, shows only a foreshortened view of that aspect. To go further, if now a chair be placed immediately behind the patient and she be told to sit down without looking round or moving her feet, one may see that in sitting the left is behind the right side of the pelvis. This is most plainly demonstrated, not by looking at the back, but by placing the edge of a flat ruler on the patellar ligaments and observing if it lie obliquely.

The effect on the spine of this infelicitous posture of the pelvis is easily understood, if only it be remembered that twist in the same direction of the lumbar spine must accompany pelvic version, and that torsion of vertebrae to the left is part and parcel of left lumbar curvature, such torsion preceding in front of causation if not in time deviation to one or the other side. There are, however, certain other points to be noted, for examination of large numbers of these patients shows that in many of them the upper part of the chest and the shoulder girdle follow the direction of the pelvic version—the left side lying behind the right—while in others these upper parts of the trunk remain straight to the feet, and on what may be called the plane of station indicated in the illustration by the tape-line—that is to say, the upper part of the spine is twisted on the lower to such a degree as to counteract for the dorsal region the torsion that has taken place in the lumbar portion. In my next paper I must revert to and show the effect of these two postures, but at present must return to my more immediate subject—the pelvis—and show how version may be corrected and its ill-effects obviated.

Mention need now only be made of four exercises I am in the habit of using, it being of course understood that in all but really severe cases one or two are only necessary. The most important one is carried out in the sitting posture, in which as already described the deviation begins and may be most readily detected. The correction consists in making the child sit evenly at lessons, especially while writing, when the posture should frequently be tested as also at other times. Likewise it is well even to reverse it, that is, taking her deviation to be the usual left version, with the left knee behind the other she is to sit for fifteen or twenty minutes a certain number of times in the day with the left knee well in front of the right, taking care that the chest be not also twisted. In a standing position my method is this: the patient stands with her back to the wall, heels against it, as also trunk; if her attendant pass her hands behind the body she will find in left version, that the right gluteal region does not touch, or only very lightly touches, the wall, the left being in firm contact. A small but rather hard cushion is now placed behind the left ilium and contact of the right side, insured by manual pressure on the iliac spine, in some cases also on the shoulder. After a few times the patient, if amen-

able and trustworthy, can dispense with this aid and pressure, but at first it is necessary. The thickness of the cushion must correspond to the severity of the deviation. Another exercise which may be described here, though I also use it as a remedial measure when spinal curvature has already appeared, may take two different forms. For left version (1) the patient lies on her left side, the thighs flexed at a right angle to the pelvis, she then rolls the upper part of the body over to the right so that while the pelvis is still quite on the side, the shoulders, chest, and as much of the loin as possible lie almost on the back. (2) The patient lies with thighs similarly bent on her right side and rolls the upper body-segment, so that this portion reposes on the front, not merely on the chest but also as much of the abdomen as she can manage. This is less comfortable than No. 1, but more potent, and its power may be increased temporarily if an assistant press gently with the hand the left lumbar region down towards the floor.

These various measures if taken alone must be considered only as prophylactic of curvature; they can, however, be also used for incipient curves.

NOTE AND REFERENCES.

¹ BRITISH MEDICAL JOURNAL, January 21st, p. 137. ² Occasionally such an injury resulting in increased vascularity and more rapid growth has a like effect as regards uneven length of limbs, although due to excess instead of to deficiency. ³ BRITISH MEDICAL JOURNAL, 1897, vol. ii. p. 335.

ON THE VALUE OF THE TREATMENT OF DIPHTHERIA BY ANTITOXIN.

By E. W. GOODALL, M.D. LOND.,

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(Concluded from p. 200.)

II.—DIPHTHERIAL PARALYSIS.

I now pass on to the consideration of the effects of the antitoxin treatment as it is shown by the behaviour of the cases of paralysis. This is an aspect of the question that has up to the present time been scarcely dealt with by those who have written on serum-therapeutics. But inasmuch as more than one important lesson is to be derived from a study of the facts, I bring them before you to-night.

It is well known that an attack of diphtheria is apt to be followed by a characteristic form of palsy. I say followed because this palsy is more a sequel than a complication of the disease. It does not often show itself before the end of a fortnight from the onset of the local affection of the mucous membrane. It has been shown that this palsy is the expression of structural changes in certain nerve tissues, chiefly nerve endings; and that these changes are brought about by the action of toxins produced by the diphtheria bacilli at the affected mucous surface, and absorbed therefrom into the system generally. If this be true then one would expect that the larger the quantity of toxin absorbed the more likely would paralysis be to follow. Now, from clinical evidence alone I have long believed this to be true. The cases of diphtheria which are severe are those in which the paralytic sequelæ supervene. By a severe case I mean one in which there is extensive and persistent exudation, accompanied usually by certain other symptoms indicative of toxic poisoning, one of the most important of which, from a prognostic point of view, is marked and persistent albuminuria.

For clinical evidence of this I must refer those interested to a paper published in *Brain* for 1895, based on a study of the cases of paralysis occurring at the Eastern Hospital during 1892 and 1893.

Paralysis therefore follows the severe cases, and the severe cases such as I have described them are those in which the toxins are absorbed in large quantities for a considerable time. Experimental evidence points the same way. Escherich, Loeffler, Ehrlich, and Woodhead²⁴ all concur in stating that the larger the dose of toxin injected into an animal the greater the liability to paralysis. The latter states: "This paralysis occurs more frequently in animals used for testing the strength of antitoxin serum, the greater the multiple of lethal units used in the test dose—that is, there are more cases of paralysis when a theoretically ten-times lethal dose is used than when one is used, and still more when the test dose is again multiplied by ten—that is, when it equals 100."

The incidence of paralysis varies considerably in different series of cases. This is well shown by the following table:

TABLE XII.—Percentage Incidence of Paralysis in the Hospitals of the Metropolitan Asylums Board.

	1893. (Non- anti- toxin).	1894. (Non- anti- toxin).	1895. (Anti- toxin).	1896. (Anti- toxin).	1897. (Anti- toxin).
Eastern	12.1	10.8	16.0	21.4	15.1
North-Western	14.0	11.1	18.9	14.1	12.8
Western	18.1	8.2	17.7	21.5	11.0
South-Western	14.3	18.3	22.0	20.6	20.5
South-Eastern	16.2	20.2	34.7	42.3	45.9
All the hospitals ...	14.3	13.2	20.7	21.3	20.3

The average incidence in non-antitoxin cases is about 14 per cent. It is quite clear from this table that in the Asylums Board hospitals this percentage has on the whole increased since the introduction of the serum treatment. But this has not been a universal experience, as indeed Table XII shows. Professor Baginsky²⁵ of Berlin, for example, stated in a discussion on diphtherial paralysis at the Edinburgh meeting of the British Medical Association that his own observations had led him to believe that the reverse was the case. I should like to point out that the incidence of paralysis will vary in different hospitals with the average duration of the patients' stay in hospital. In some of the Continental hospitals it is usual for the patient to be sent home very soon after the local exudation has cleared up, hence, doubtless, a low paralysis-rate. With patients kept in hospital five weeks or longer, experience shows that since the introduction of antitoxin the paralysis-rate has gone up. The reason usually given, a very probable one, is that more severe cases survive the early and fatal stages of the disease, and either recover or live sufficiently long to become paralysed. But while it appears from the above facts that under the prevailing conditions we have lost ground in our endeavours to prevent this serious sequel of diphtheria, I wish to bring especially before your notice some other facts which show that if the cases be looked at from another point of view, far from having lost ground, we have made considerable advance. For the following figures I am indebted to my colleague, Dr. Wool-lacott, who has been at great pains to extract them from the hospital records. They form part of a valuable paper written by him, at present unpublished, which I have had the opportunity of reading. Dr. Wool-lacott has abstracted the notes of 1,510 cases of diphtheria treated with antitoxin, and uncomplicated by the concurrence of any such disease as measles or scarlet fever. These cases were consecutive cases admitted during 1895, 1896, and 1897.

TABLE XIII.—Showing Incidence of Paralysis in 1,580 Cases of Diphtheria Treated with Antitoxin at the Eastern Hospital during 1895, 1896, and 1897.

Day of Disease upon which Antitoxin was first Injected.	Total Number of Cases.	Total Number of Cases of Paralysis.	Percentage Incidence of Paralysis.	Number of Severe Cases of Paralysis not Fatal.	Number of Fatal Cases of Paralysis.
1st	69	4	5.7	0	0
2nd	277	28	10.1	1	0
3rd	340	53	15.5	5	3
4th	323	61	18.8	8	7
5th and later ...	571	147	25.7	28	8
Total	1,580	293	18.5	42	18

It will be noted that of these cases 293 developed paralysis, an incidence of 18.3 per cent. But contrast the incidence of paralysis in the cases treated early with that in those brought