FURTHER OBSERVATIONS UPON THE "DERBY-SHIRE NECK."

Read before the Midland Branch.

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In a paper read some years ago before the Midland Branch, I gave a tabulated statement of the various forms of bronchocele met with in a practice of many years in a goitrous district. The close connection between the goitrous mother and the cretin child was in that paper clearly established; but how to account for the connection remained then, as I believe it remains now, a matter of mystery and speculation. How is it that a sharp intelligent woman with a goitre, married to a man of equal intelligence, has a child who becomes a cretin; whilst other children of the same parents are not wanting either in physical or mental power; or, to speak more definitely, how is it that one or two children in a family become dwarfed both in

mind and in body, having the development of the cerebro-spinal centres arrested, and assume the form of funny little creatures, even when beyond the period of puberty, looking prematurely old, and having thick bony skulls and expressionless faces? I have a family in my

recollection at this moment, consisting of a man and his wife (since dead) having a large fibrous goitre. Both are of average mental capacity. They have some sharp children, and also two cretin women, their offspring. These latter, in age between 20 and 35, are stunted in growth, and have but limited powers of understanding, or even of

going to and fro, except in the shuffling gait of the paralytic. They sit from morning till night, nursing a doll, or other toy, and comporting themselves as very little children do, but with only a fractional part of their intelligence. Here is a representation of one of these curious little creatures.

This is a case for "collective investigation;" but the investigation must be quick, or before it comes, bronchocele and cretinism, as I shall hereafter explain, will be gone.

In discussing the various plans of treatment for the lessening or removal of the enlarged thyroid body, I mentioned, in the paper before alluded to, the very limited experience I had had in the treatment of fibrous goitre by the injection into its substance of the tincture of iodine, a practice which I learned from a very able paper read at King's College some years ago by Dr. Morell Mackenzie. I have now used this plan of treatment in sixteen cases, and not, I think, with any very splendid results—results in no way superior to the ordinary treatment by the old iodine paint applied externally, and the internal administration of either the iodide of potassium or the iodide of iron. Thus, of these sixteen cases, in seven there was complete reduction of the gland after using injections once a week or a fortnight, for a time varying from two to eighteen months. In five, there was some lessening of the mass; but the patients became tired of it, and discontinued the treatment. In two, no marked benefit was observed. In two others, the inflammation brought on by the injection assumed the suppurative form, and ended in abscess; and one of these patients, a woman in a respectable position in life, nearly succumbed to pressure upon the right recurrent nerve, paralyzing on that side the abductors of the vocal cord. The distress and dyspnoea were of such urgency as to necessitate at an early period an incision into the substance of the gland, and evacuation of the pus, which gave immediate relief. There is reason to believe that the trouble and distress in these two cases might have been prevented by closer attention on my own part. Either the syringe-point was not forced to a depth sufficient into the fibrous mass, and a drop of the tincture of iodine escaped into the connective tissue between the gland and the skin, or, perhaps, in removing the point of the syringe, adequate pressure was not made upon the perforation through which the fluid was injected, and so a drop or two of it in this way entered the cellular tissue.

I know that the injection of the cysts, in the cystic form of bronchocele, with a strong solution of perchloride of iron, has been practised by some authorities with varied success. I have never attempted this practice, because I feared the consequences of any great lateral or median pressure, which might, as I have known it in a case of malignant disease of the thyroid gland, completely paralyse the abductors, and close the glottis. Years ago I have several times, before the revival of ovariectomy by Clay, of Manchester, passed a seton into an ovarian tumour, and brought out the folds of silk again through the abdominal wall, removing it when complete adhesion, between the cyst and the wall of the abdomen, had been established. As soon as all acute inflammatory symptoms had passed away, a solution of perchloride of iron, or the tincture of iodine, was injected into the cyst, generally with the effect, after several injections, at intervals of a fortnight or three weeks, of completely obliterating it. It is manifestly a different thing to inject an ovarian cyst, and to produce acute inflammation in the thyroid gland; and I cannot agree with a writer in the BRITISH MEDICAL JOURNAL, a little time ago, who said, that such operations are unattended with risk. There is one circumstance in connection with enlargement of the thyroid gland which is especially worthy of note; and that is, that the distress in breathing is in no respect proportionate to the size of the tumour. If the swelling be in the middle line, at or near the isthmus of the gland, and be tightly compressed by the fasciæ of the neck, so that the wind-pipe or larynx cannot work with freedom, or there is pressure upon one or both of the recurrent nerves, producing more or less paralysis of the abductors, then the distress and dyspnoea are very marked. If, on the other hand, the tumour be ever so large, and it become a necessity even to support it with a handkerchief or bandage, provided it is free and able to extend itself in a downward direction towards the sternum, distress is seldom complained of, and the risk to the patient is minimised.

I have tried many other plans of treatment besides that of injection, and have not found any better than that used a generation ago; namely, the combined internal and external use of iodine. The tumour is painted daily with a solution of iodine, just half as strong again as the ordinary tincture, whilst the patient takes five grains of iodide of potassium at first (to be gradually increased to a scruple, in the absence of iodism), twice or thrice daily, in a tumbler of water. I think it is Mr. Jonathan Hutchinson who recommends the iodide to be given in this way, and without combination with any other drug, in syphilitic

disease; and its effects have certainly seemed to be more pronounced when given uncombined and largely diluted with water, in thyroid enlargement. In cases where the iodide of potassium is not well borne, I substitute for it a pill of the iodide of iron.

The question is often put to me, as it doubtless is to other practitioners, by the sufferers from recent bronchocele, whether it is well to remove from a goitrous district to another in which goitre is comparatively unknown; and the advice I generally give is that, if there be no ascertained hereditary taint, that is, if the mother or grandmother have not been goitrous, and especially if the woman be young, and have suffered only since coming to live in the district, it is wise to select another residence, if this can be managed without inconvenience; whereas, in those who have suffered long from bronchocele, and there is clear hereditary transmission of the hypertrophy, and especially if the character of the swelling have become changed to a cartilaginous, bony, or calcareous mass, then there is no real advantage in moving from the district.

I have recently seen the benefit of change of place, coupled with long continued treatment, in the case of a lady, who first came under my notice in February, 1884. She had been married only two years, and for that time only had lived in Derbyshire. Since her marriage she had noticed (but she could not tell the precise time) a small swelling on each side of the isthmus of the gland. She came to me in great distress, and was very nervous and excited about the swelling, more than its small size seemed to justify. The pulse was quick, and the eyeballs remarkably prominent; the face was flushed, the area of cardiac dulness increased, and a murmur, synchronous with the first sound of the heart, was heard at its base. I had no hesitation in advising (especially as it could be afforded) a change of residence for this patient. She at first went to a village near Derby, from a hilly part of the country, and now she has gone to live about forty miles farther south, not far from the district in which she was born and lived during childhood; and when she last came to see me (April, 1885), after having taken the perchloride of iron in large doses for more than twelve months, and painted the swelling with iodine tincture periodically during that period, although the goitre had not quite disappeared, there was an absence of all nervous excitement or distress, the eyeballs were no longer prominent, and the cardiac murmur was gone.

Exophthalmic goitre is not a very common affection in Derbyshire, as far as I can judge, yet other practitioners may possibly have seen more of it than I have. When I last spoke to the Branch upon the subject, I had noted thirteen cases. I have since seen only three, two in my own practice, and one under the care of my colleague, Mr. Broster, at the Wirksworth Hospital.

We are apparently as far as ever from any clear demonstrative proof of the real cause of this curious hypertrophy, and shall be, I expect, till the true functions of the thyroid gland have been discovered. Observers still cling to the theory that it is, in some hitherto unexplained way, associated with the water drunk. If so, how is it that the disease is confined almost exclusively to women, for men have equally with them the luxury of a thyroid gland? Snow-water, rain-water, magnesia-water, water impregnated with calcium carbonate and sulphate, have each had their advocates for the causation of goitre; and, at last, the sulphide of iron in the drinking-water is asserted by St. Lager to be causative in some way of this affection. Years ago it was assigned to the presence of large tracts of magnesian limestone in any district, because goitre appeared to be prevalent wherever such strata neared the surface; then the carboniferous limestone theory was in the ascendant, and took half the credit. These theories may at any time be proved to be fallacious, because goitre is seen (and was seen thirty years ago much more than it is now) equally common upon the Yoredale rocks and millstone-grit measures of Derbyshire, as it is upon the limestone formations; moreover, some places built upon the limestones derive their water-supplies from the surrounding Yoredale rocks, from which they are conveyed to the inhabitants in a state of comparative purity, and the water coming from these springs contains less than the usual proportion of lime salts. The town of Wirksworth, for instance, is built upon the carboniferous limestone, which is, for the most part, drained of its water by the Meerbrook Sough, which, in order to relieve the lead-mines in the valley of Wirksworth of water, empties itself into the Derwent, not far from the town of Cromford, so that limestone-water is not drunk here. The water used is brought in iron pipes from the millstone-grit measures on the east side of the town, from which it issues in springs of remarkable purity. The water has been analysed several times. This is what Dr. Bernays says of it: "It is beautifully clear and sparkling, very soft and available for every household purpose. It contains a large amount of carbonic acid, to which the briskness of the water is owing. On further investigation, I find in one gallon:

	Grains.		Grains.
Sulphate of lime	0.6500	Silica	0.0080
Bicarbonate of lime	2.4480	Carbonate of potassa	Traces
Bicarbonate of magnesia	0.1370	Organic matter	1.1210
Bicarbonate of iron	0.0080	Free carbonic acid	7.2160
Carbonate of soda	Traces	Its specific gravity is	1.00014
Chloride of sodium	0.0258		

"In conclusion, it is just such a water as one would expect from the millstone-grit, and I have no hesitation in saying that no town in England is supplied with one of better quality."

The urban sanitary authority has lately had the water analysed again, and the report of another analyst corresponds very closely with that of Bernays made many years ago. Here is a water, then, containing a very small quantity of lime-salts, and only an infinitesimal proportion of iron; and yet the district, thirty years ago, was unmistakably goitrous. It is much less so now, from causes which admit of easy explanation, the water drunk coming from the same springs now as then. The most recent theory, as far as I know, is that of St. Lager, who attributes the presence of endemic goitre in some parts of France to the impregnation of the drinking-water with iron sulphide, an insoluble salt, but readily converted into a soluble sulphate; and in this way he believes it impregnates the system, and is a cause of bronchocele. Were this theory tenable, it would follow, one would think, that whenever we give our women patients sulphate of iron, which is often done in much larger doses than could be got from the drinking-waters of France, and often for considerable periods, we should produce in them enlargement of the thyroid gland; but this is not so in my experience, or in the experience of other practitioners in the county of Derby to whom I have spoken upon the subject. St. Lager says, in his interesting treatise on *Bronchocele*, that he has produced enlarged thyroid in mice by giving to them for months iron sulphate. I am naturally sceptical about the production of bronchocele by iron, because it does not appear that this hypertrophy is more common in the coal or shale districts of Derbyshire, where the inhabitants get their water from the shale, which contains more iron than is found in the waters obtained from the other formations.

1. As far as I have been able to ascertain, enlargement of the thyroid gland begins, in at least 90 per cent. of those affected, at or about the period of puberty, when the vascular system is brought into greater activity for the development of special functions. This gland, being made up of innumerable vesicles, bound together by connective tissue, and surrounded by networks of capillaries, deriving their blood-supply from branches of the carotid, subclavian, and innominate arteries, is necessarily a highly vascular gland; and, heredity being present, it is possible that the increased blood-supply at the period of puberty may cause in women predisposed to this hypertrophy, in some cases, increased cell-formation in the connective tissue of the gland, culminating in the development of the fibrous form of the hypertrophy; or in others, enlargement of one or more vesicles, ending in the cystic form of the disease. This is a theory of my own, and may be taken for what it is worth.

My friend, Professor Furneaux Jordan (*Surgical Inquiries*, p. 16), of Birmingham, believes that the natural function of the thyroid gland is supplementary to respiration, and that, where respiration is impeded from any cause, the thyroid gland increases in functional activity. During sleep, during pregnancy, while carrying burdens, during any mechanical restraint in breathing, the thyroid gland enlarges. It enlarges also in diseases which impede respiration if they be not attended by wasting, and by diminution of the totality of the blood. He is of opinion that goitre is a true hypertrophy of the thyroid gland from the excessive performance of functional duty. This theory explains to some extent the occurrence of bronchocele when the girl is approaching womanhood: and also those cases which happen in women who get their bread as workers in the cotton-mills of Derbyshire, and who have frequently to walk two, three, or even four miles, over steep hills to their work before six o'clock in a morning, then to live in a flocculent atmosphere, working all the time, for ten hours every day, and afterwards to tramp over the same ground to their homes at night.

2. Enlargement of the thyroid gland is for the most part seen in women belonging to the working classes, although not altogether confined to them. It is also common in those whose ancestors have intermarried.

3. It is found equally amongst the Yoredale rocks and limestone formations, and does not appear to be confined to those who drink any special character of water.

4. It is much less prevalent now than it was thirty years ago, and yet the women drink the same waters. They get better wages, which means better and more nutritious food. The railway communication, which did not then connect the goitrous districts with the county-

town, has now given the people opportunities and means to pay visits to other parts, of which they constantly avail themselves; consequently, there has been less intermarriage, and less breeding in-and-in; and I am decidedly of opinion that, if the decrease of bronchocele take place in the same ratio as it has done in the last generation, ere another has passed away, endemic goitre will, in so far as Derbyshire is concerned, have almost disappeared.

THE TUNING-FORK IN DIAGNOSIS OF LESIONS OF THE INTERNAL EAR.

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UNTIL quite recently, it was—and by many aural surgeons it even now is—an accepted theory that, if the tuning-fork be heard by bone-conduction better in the deaf or deafer ear, the labyrinth is intact. To those who have followed the otological literature of the last few years, it must be known that this rule is by no means without exceptions. Twelve years ago, or more, Cassells, of Glasgow, published a case in which, after exfoliation of the left cochlea, the hearing power actually improved, and all the notes of the piano were perceived. More lately, Schwartz and Christenneck had under their care a patient who, in spite of the loss of the right cochlea, continued to hear the tuning-fork (C) by bone-conduction louder in the affected ear. Jacobson, too, has recorded a case in which, notwithstanding suppurative disorganisation of the cochlea, hearing by bone-conduction was retained until just before death. The last contribution towards this subject is by Gruber, who records an instance of exfoliation of the two upper convolutions of the cochlea, associated with only partial loss of hearing on the affected side and retained bone-conduction. Schwartz, in his recently published work, accepts frankly the position which alone is tenable—assuming, as we have every reason and right to assume, that these observations are accurate. According to this author, retained bone-conduction only proves the trunk of the auditory nerve and its centre to be sound, but does not necessarily imply a healthy condition of the labyrinth. But, even with this evidence before them, there may probably be found those who, on the ground that such facts are contrary to physiological common sense, will refuse them the consideration they deserve in clinical investigation.

The following is a brief record of a case which recently came under my observation. Mr. — some months since fell from a height, striking the right temporo-parietal region. He was stunned, and for two days could not stand. During this time, there was paresis of the right arm and leg. Giddiness was at first intense, and is still troublesome. His right ear has been deaf ever since. The tuning-fork (the large fork used by Politzer, furnished with brass clamps, and vibrating 512 per second), placed on the middle line of the forehead, was better heard in the right ear, and was also distinctly perceived from the mastoid of the same side. The same remarks also apply to a small fork of higher pitch. The giddiness is increased by turning from right to left, but not from left to right. The right ear is quite deaf, and even words spoken loudly through a conversation-tube are not heard. The drum-membrane on the right side was slightly depressed, but moved freely outwards on Valsalva's experiment—needless to say, without improving the hearing power.

Taking all the facts of this case together, we cannot but arrive at the conclusion that the labyrinth of the affected side was injured, either by concussion or fracture; and yet the hearing by bone-conduction was not only as good as, but even better than, that of the healthy ear. It did at first occur to me that a rupture in the continuity of the chain of ossicles might account for the symptoms, but the persistent giddiness could not be explained on this hypothesis.

This case, then, taken together with the evidence before adduced, proves to my mind that better hearing by bone-conduction is by no means certain proof of a healthy condition of the internal ear. It is well known and admitted that the converse proposition is also subject to numerous exceptions. Thus we meet with cases of chronic middle-ear catarrh, in which bone-conduction is interfered with, and which are readily amenable to treatment. In acute inflammation of the tympanic cavity, the same state of matters is often produced.

To discuss this matter in all its bearings would occupy too much space, and would, I feel, in the present state of our knowledge, be of but slight value. I cannot help, however, before I conclude, call-

ing the attention of those who are interested in otology, to the fact that the time-honoured tuning-fork test must now be considered as uncertain, whether in the positive or negative sense. No doubt it is a valuable aid to diagnosis, so far as we at present know, in a majority of cases; but then arises the question whether the number of exceptions may not increase more than we expect, as our knowledge augments.

LITERATURE.—Christenneck: *Archiv für Ohrenheilkunde*, Vol. xviii; Jacobson: *Archiv für Ohrenheilkunde*, Vol. xxi; Gruber: *Monatsschrift für Ohrenheilkunde*, etc., August, 1885; McBride: *Syphilis of the Ear and Throat*, *Glasgow Medical Journal*, 1885; Schwartz: *Die Chirurgischen Krankheiten des Ohres*, 1884.

DELUSIONS, THE RESULT OF INTESTINAL ACCUMULATIONS.

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I PROPOSE to bring under notice the following case of mental delusion, dependent on intestinal accumulation, and its resulting reflex derangement.

My patient, a lady, about 50 years of age, was brought to me with the following history. She had been married for twenty-nine years, and had brought up a family of six children, all of whom were healthy; no miscarriages. Her general health had been remarkably good all through her married life; she had been a good wife, and an exemplary mother. She had passed the change of life without any marked nerve-derangement. Her family-history was good; no traces were discoverable in it of mental derangement, or of serious hereditary disease.

About a year ago, she began to lose appetite and flesh; her skin became harsh, dry, and yellowish in tinge; her digestive powers became greatly impaired; once or twice there had been some vomiting of blood, and a troublesome dry cough had developed itself. These symptoms led, on the part of her family, to a fear of consumption, which fear was dispelled by a medical examination. Remedies, however, failed to relieve her symptoms; and, about eight months ago, mental delusions began to show themselves. These at first took place invariably at night, and were, from first to last, of one class only—namely, that connected with taste and smell.

At first, two or three times a week, and of late nightly, the patient would complain that some one was burning sulphur or phosphorus in the room. She would get up frequently to search the room for a man who, she supposed, was smoking. She became impressed with the idea that her husband and children produced these smells, in order to annoy her, and, if possible, to kill her; and twice she had left the house, and remained away for days, in order to rid herself of her supposed persecutors. The smells, however, followed her wherever she went, and she came to believe herself the victim of a wide-spread conspiracy. About this time she began to refuse food, alleging that it contained poison, and that she could distinctly taste arsenic and sulphur in everything that was prepared for her. She accused the grocer, the milkman, the baker, and the butcher, of attempts to poison her, and communicated her suspicions to the police.

When brought to me, her condition was as follows. She was much emaciated, and disinclined to talk, had a stupid and spiritless aspect, a cachectic look of the skin, yellowish conjunctiva, etc. She made no special complaint, other than of the conduct of her friends. The bowels were said to be regular. The urine was thick, depositing lithates in abundance; no albumen or sugar. Examination of the special senses and of the chest resulted negatively. Inquiries about the abdomen elicited the fact that a sense of weight and of movement had latterly been much complained of, and I determined on making an examination of the part. On inspection, a curious state of matters became apparent. The position of the transverse and descending colon was occupied by a large elevated ridge, and the movements of the smaller intestine were distinctly visible through the thin abdominal walls.

It is scarcely necessary to add that the elevated ridge was produced by an immense collection of hardened feces, which it took several days, with the aid of spoon-handles, injections of glycerine, castor-oil, hot water, and the free use of mild aperients, to remove. The first scybalum passed was so large and hard, that it actually once seriously occurred to me to place the patient under chloroform, and extract it with Simpson's short forceps.

It is now six weeks since the accumulations were removed, and in that time the patient has increased wonderfully in weight. She eats