

lasted three weeks. Iris discoloured, adherent to capsule; lymph filling pupil and part of anterior chamber. Was for some time under the treatment of a celebrated oculist, who declared the eye as incurable. Patient consulted me for muscæ volitantes in the other eye. Iridectomy and subsequent extraction by my method. Was out the third day after extraction. Reads No. 16 of Jaeger with 2 convex.

3. *Traumatic cataract, with hypopion and posterior adhesions; cured.*—A. D.—, aged sixty-three, mason. Left eye struck with a piece of granite, resulting in inflammation and hypopion. After three months' treatment, iridectomy and subsequent extraction by my method. Reads No. 12 with 2½ convex.

4. *Double cataract, with undilatable pupil, in an epileptic; cured.*—Mrs. B.—, aged sixty-five. Subject for some years to epileptic fits, coming on irregularly. Operation by my method. Had a fit the day after extraction, which, however, did not interfere with perfect recovery. Reads No. 10 four weeks after extraction.

These cases (which I exhibited at the time to the Aberdeen Medico-Chirurgical Society) having proved so satisfactory, induced me to give the plan an extended trial, with the result of the loss of only 4 out of 107 cases, as shown in the following table:—

		Hospital cases.		Private cases.		Total.	
Senile	57	...	32	...	89	
Traumatic	12	...	3	...	15	
Glaucomatous	3	...	0	...	3	
		<hr/> 72		<hr/> 35		<hr/> 107	

Results.

	Senile.	Traumatic.	Glaucomatous.	Total.
Healed well, with perfect vision... ..	81	12	1	94
Healed well, but no vision... ..	2	3	2	7
Healed well, required subsequent operation	2	0	0	2
Lost by internal hæmorrhage	1	0	0	1
Lost by suppuration	2	0	0	2
Lost by iritis... ..	1	0	0	1
	<hr/> 89	<hr/> 15	<hr/> 3	<hr/> 107

Remarks.—1. When these papers were begun, the number of cases in which I had practised the operation was 96; since then I have had 11 more—4 traumatic and 7 senile, all resulting in immediate success.

2. The case lost by internal hæmorrhage was a lady, aged eighty-two, for many years subject to rheumatism. The hæmorrhage was profuse, lasting for two hours, the result probably of a diseased condition of the choroidal vessels.

3. One of the cases of suppuration, which came on the next day after the operation of iridectomy and extraction done simultaneously, was that of a pauper woman of premature senility, with all the joints distorted by rheumatism; small sunken eyes, with granular lids, and blephero-adenitis—a case, in short, in which I operated against my judgment, circumstances having, in a measure, compelled me to attempt it. This will serve to show that many cases have been operated on by this method which would never have been attempted by the old operation.

The only objection that can fairly be made to this method—namely, that it makes two operations instead of one—may be met by the fact that Graefe's operation, in the hands of Professor Arlt, has required subsequent operation in 10 per cent. Of these secondary operations, according to Wecker, only 50 per cent. recover sight; if, therefore, two operations are to be performed, it is infinitely preferable that the secondary one should precede, and not follow, the extraction. Besides which, it is frequently of essential importance to become acquainted with the habit of the patient's system, which we do during the previous iridectomy. As an example of this I may cite an instance of tobacco delirium which nearly produced serious results:—

In February, 1862, Miss E. C.—, aged sixty-eight, was brought to me affected with double cataract. I extracted the cataracts from both eyes by the ordinary superior flap at the same sitting, assisted by her medical attendant, Dr. B.—, of M—. All went on well for the first thirty hours after the operation, when we were suddenly summoned, as the patient

was delirious, and fighting with the nurse to get out of bed. On our arrival we found her half out of bed and talking incoherently. On inquiry, we learned that she was a confirmed smoker, and that since the operation the nurse had refused to allow her accustomed smoke. A full opiate quieted the symptoms at the time, and the allowance of her pipe prevented a return. She recovered without any other bad symptom, with excellent vision of both eyes.

Notwithstanding my conviction of the advantages of my operation, I have not altogether abandoned the old flap extraction, but still perform it in a few exceptional cases, such as the following:—

A venerable city clergyman, aged eighty-one, cataractous, was affected with such extreme tenderness of the skin that a slight scratch, or even rough friction with a cravat, produced erysipelas. A drop of a solution of atropine on the eye caused serous chemosis and œdema of the eyelid, lasting for a considerable time; and the least touch on the eye made him shrink, producing spasm of the orbicularis. In this case it was evident that, if the cataract was to be removed, it must be done quickly through the cornea. Accordingly, I extracted by Daviel's method, which proved highly successful.

A lady, about seventy years of age, was brought to me from the country. I wished to operate by my own method; but her medical adviser, Dr. Kilgour, represented that her mind was so made up to have her operation finished within a few days that the delay would be unendurable, and, in the then condition of her nervous system, unadvisable. I therefore operated by the ordinary flap. Six hours after the operation a fit of retching and vomiting occurred, caused probably by nervous excitement, notwithstanding which she made an excellent recovery, with perfect vision.

But considering the great anxiety which these cases cause, the care which they require, and the uncertainty which they involve, even after the best executed work, I am more than ever determined to reserve it for very exceptional cases, and, as a rule, to adhere to the operation which I proposed.

In conclusion, the advantages of the procedure which I now advocate may be summed up as follows:—1. It is the safest; all the different stages of the operation may be gone through with precision, safety, and almost certainty of success. 2. The chances of success being so high, we need not put off the operation until blindness of both eyes is complete, but may perform it as soon as one eye is blind and the other becoming so. 3. It does not require long confinement, and does not distress the patient. 4. It is applicable to cases of local and constitutional complications in which Daviel's operation is inadmissible.

ON AN EPIDEMIC OF TYPHOID FEVER.

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DURING the early part of the month of March, 1868, five males were sent into the fever department of the Glasgow Royal Infirmary, under my charge, from the works of the Garnkirk Fire Clay Company. All of them were labouring under enteric fever, and as the investigations which I was enabled to institute respecting them have a direct bearing upon the etiology of typhoid fever, it has occurred to me that a short account of the facts ascertained will not prove uninteresting to my professional brethren.

Since last autumn, enteric fever has been prevalent in Glasgow to an extent rather above the average of what has existed for a few years past, and a reference to the streets from which patients have been sent to the hospital shows that it is endemic in particular localities.

It is not within my province to interfere with the sanitary arrangements for the city of Glasgow, but when a number of cases of fever, all of the same type, were sent to the hospital from the works before mentioned, I thought it my duty to communicate with the manager of the works, and to direct his attention to the fact that an epidemic had broken out amongst his employes of a disease which in all probability could be put a stop to, if the immediate cause of its propagation were discovered, and, if possible, removed. The manager at once requested me to visit the works and cottages of the Company, and to make an inspection of their sanitary condition, in conjunction with Mr. Murray, who is the regular medical officer

employed by the Company. I did so; and having, as I believe, discovered the immediate cause of the fever, I recommended certain measures for its suppression, which it is unnecessary to detail, and upon the adoption of which the outbreak of enteric fever speedily subsided.

In large towns it is in almost every instance a very difficult matter to trace out the origin or mode of propagation of cases of enteric fever, and it has rarely occurred to me to arrive at any satisfactory conclusion from such investigations. I therefore gladly availed myself of what I considered a very favourable opportunity, as, from the circumscribed nature of the Garnkirk works, I felt confident it might lead me to some interesting conclusions.

I may here state, for the information of those who are unacquainted with the situation and surroundings of the Garnkirk Fire-clay Works, that they are situated at about six miles from Glasgow, immediately on the line of the Caledonian Railway, from which a line of rails enters the works for the purposes connected with the manufacture of the fire-clay bricks, tiles, and many other articles, which are noted over the whole globe for their superior quality. Directly adjoining the works, and on ground rising somewhat towards the north and west, are a number of cottages inhabited by the work-people and their families. The entire population of the surrounding houses may be roughly estimated at between 600 and 700. Beyond the workmen's cottages, and extending on every side, is an undrained moss, beneath the surface of which the famous fire-clay is found. With the exception of one or two small farm-houses and some pitmen's cottages, there are no other dwelling-houses within nearly a mile of the works. On the north side of the kilns and workshops, and surrounded almost on three sides by the cottages, is a large pond or reservoir of water for the use of the works and workpeople. This reservoir is supplied with water from an adjoining clay-pit, the shaft of which is situated about 500 yards distant. The water is pumped out of the pit, and conveyed to the reservoir through fire-clay pipes, which are embedded only to a very slight depth in the ground. The number of men at work in the pit at the date of my inquiry was about fifty, and at that particular time the number was much less than the average of those who usually found employment there. I ascertained that there were no privies in the pit, and that the pitmen were in the habit of passing their evacuations, when necessary, at any convenient part of the workings. From the clayey nature of the floor of the pit, it can readily be understood that little or no absorption takes place, and the whole drainage of the pit gravitates to the bottom of the shaft, whence it is pumped up, and the water so collected passes through the before-mentioned pipes to the reservoir. The greater part of the surface drainage from the ground surrounding the cottages, as well as the sewage and waste water from the houses, is intercepted before reaching the reservoir, and carried off by open surface drains running parallel with it, and those open drains are regularly swept and kept clean. At the end of the pond, however, at which the water supply-pipe is led in, I observed a considerable quantity of sewage and surface drainage finding their way into the reservoir. From this fact, and judging from the general appearance of the water in the reservoir, there could be no doubt of its being largely contaminated with sewage and putrefying matter; but, on the other hand, there is no proof that the water taken directly out of the reservoir is ever employed for drinking or cooking. At the back and side of the row of cottages, immediately adjoining where the conducting pipe passed, I observed that the ground was thickly studded with human excrement, and refuse thrown out from the houses, the privies and dungsteads being somewhat deficient there. Workmen were, however, engaged in preparation for building them, and I understand that the deficiency has since been supplied.

In addition to other measures recommended, I advised that the joints of the conducting pipe in the neighbourhood of the cottages should all be carefully examined and made secure. I have since been informed that when this was done, one of the fire-clay pipes at this particular part was found to be broken, and, moreover, that the surface water from the ground to which I have just referred was seen to flow into the broken pipe.

Here, then, was a clear proof of the impure and unwholesome state of the water passing through the pipe; and as all the water for domestic use was drawn from this pipe as it falls into the reservoir, seeing there is no other source of supply, we need feel no surprise at the outbreak of enteric fever which took place amongst those who made daily use of it. I regret that I have not been enabled to make out the exact amount of impurities in either the pit or reservoir water by an accurate

chemical analysis. I requested a specimen of the water to be sent to me for the purpose of analysing it; but my request was not complied with.

Throughout the cottages adjoining the works there had occurred during the past month, and up to the date of my visit, about forty-five cases of enteric fever (without being strictly accurate as to numbers). A few of the cases had been removed to the Glasgow Royal Infirmary; but the majority were under treatment in their own homes. There was also one patient suffering from enteric fever in a cottage on the opposite side of the railway, and situated only a short distance from the works; and it is an interesting fact to note that the inmates of this cottage derived all their water-supply from the same source as the people in the works.

Mr. Murray also mentioned to me that he had at that time one patient suffering under the same fever in the village of Chryston, which is nearly two miles from Garnkirk; but that up to the time of his seizure he was employed in the fire-clay works. I was not able to hear of any cases of the disease among the workmen of the same company who resided at a place called Crow-row, less than half a mile distant from Garnkirk, but which is supplied with water from a different source.

It is worthy of remark, that the proprietors of the works have for years been in the habit of furnishing, gratis, a filter for the use of the inmates of each cottage. Only a few, however, of the householders availed themselves of this offer; and it is somewhat remarkable that I did not find a single case of fever in any of the houses where the water was regularly filtered before being used for drinking or culinary purposes. Mr. Murray subsequently informed me that one or two cases did occur among those who used the filters; but that the proportion of those attacked in the houses where filters were in use was very much smaller than among those who used the water unfiltered.

Very shortly after the adoption of the measures recommended for the prevention of the contamination of the water, a marked diminution in the number of individuals attacked was observed to take place. In about a month after, the fever was almost eradicated, there being only five or six cases, and those of a much milder type, and principally confined to children. There were in all above sixty individuals attacked, and amongst these the proportion of fatal cases was very small. At the commencement of the epidemic the type of the fever was somewhat indefinite. Bronchial symptoms were more prominent than enteric symptoms, and several of the patients were sent into the general medical wards of the Glasgow Royal Infirmary as cases of bronchitis. In a short time, however, the abdominal symptoms became more decided, and the characteristic diarrhoea, which was altogether absent in many of the earlier cases, soon assumed a very severe form.

I endeavoured to trace out the history of the first case of enteric fever that had occurred at the works, and likewise if any connexion could be discovered between the first and the succeeding ones. A rumour was mentioned to me of two men having recently come to the works who were at the time suffering from, or were immediately after attacked by, the fever. On strict inquiry, however, I was not able to find any foundation for this rumour.

Whether the germs of the disease were introduced from without, or originated *de novo* in some of the individuals who were using the water contaminated as I have pointed out, is not in this instance able to be proved beyond doubt. It is certain, however, that the very first case occurred in one of the cottages in the row immediately adjoining where the pipe conducting the water passed, and where I before mentioned that the privies and dungsteads were deficient.

If, as is more than probable, the intestinal discharges from this first case found their way into the pipe, the propagation of the fever by this means was most certain; and if the manager had not promptly carried out the recommendations for the suppression of this and the other likely sources of its propagation, there is little doubt that the consequences would have been much more disastrous.

Glasgow, May 5th, 1868.

THE PRIZES AWARDED BY THE ACADEMY OF SCIENCES OF PARIS.—On the 18th ult., the prize of experimental physiology was gained by M. E. Lyon; M. Baillet was proposed for a second prize; and M. Moura obtained a certificate. Medicine and Surgery: M. Chauveau, £100; M. Courty, of Montpellier (a book on diseases of women), £100; M. Lance-reaux (on venereal diseases), £100; Unhealthy trades, M. de Freycinet, £100; Bréant Prize (cholera), a reward of £60; Barbier Prize (incurable diseases), M. Huguier; Godard Prize, M. Legros.