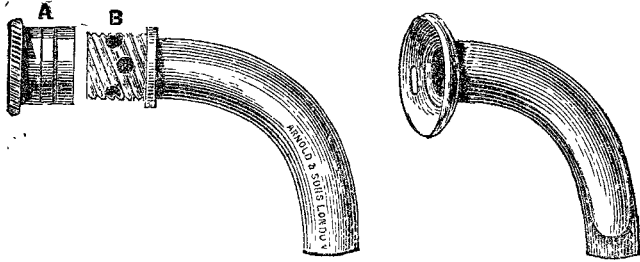


How has it lost its cunning? Have the nerve-centres, the nerves, the muscles, or the joints of this apparatus become disabled? We are inclined to think that each and all of these structures have become in some degree affected; that disease has played the part it ever plays, and has resulted in loss of response and of coördination of nervous and of muscular structures and in stiffness of joints. It was this view that led me to ask of Messrs. Arnold and Son to make the instrument here represented, an instrument devised with the object of bringing into play the powerful influence of use—i.e., with the object of teaching the laryngeal nervo-muscular mechanism to retake to its proper duties, and this by constantly maintaining a certain amount of dyspnoea.



We may call A the cap and B the projecting portion, the added portion of the tracheotomy tube. B is perforated with slits and holes. A can be screwed down over B so that with every advance of the cap a portion of the windows of B is obliterated. The object will be readily understood. When the obstruction to supra-tracheal respiration no longer exists the cap is applied as early as possible; the patient breathes then with some difficulty, and for some days can bear no more than a very small obliteration of the holes. The patient has just some difficulty in breathing, and attempts every now and then to open the glottis and occasionally to call out crying. At times through the day the cap is screwed down so as to cause severe dyspnoea for a while, and the patient makes corresponding efforts to open the glottis. Improvement is first noted when the patient calls out crying, at first feebly but soon lustily, and then begins to call out, "Nurse," "Yes," "No," and this, though the child may never have spoken prior to the operation of tracheotomy.

This apparatus was applied in the following case. M. C—, aged nineteen months, was admitted to St. Bartholomew's Hospital, June 15th, 1882, and she was tracheotomised almost immediately for orthopnoea. The child progressed well; the largely swollen tonsils and sub-maxillary lymphatic glands became of almost natural size in about four weeks, and though no discoverable obstruction remained, the child could not breathe when the opening of the tracheotomy tube (furnished with a large laryngeal opening) was closed, nor could it breathe for more than a few minutes when the tracheotomy tube was removed, in which case it breathed only as long as the tracheal opening remained patent. The child, moreover, made no progress in this particular; and, two weeks later, the above described tube was used, the openings were gradually obliterated by screwing down the cap; and about two weeks later it began to inspire through the glottis. About two weeks later the child was able to breathe throughout the day with the cap screwed fully home; but it could not sleep with the holes thus obliterated until another week had passed, and then it wore the tube continuously for a whole week by night and day. The tube was then removed and was not again required; and the child was discharged on Sept. 11th, 1883. She has not suffered since from cough or dyspnoea; and at the present time she is strong and robust.

Again, C. E—, aged eighteen months, was admitted to St. Bartholomew's Hospital, Aug. 13th, 1882, for diphtheria, at the time suffering from intense dyspnoea, for which he was tracheotomised. He recovered in every way, but I could not induce him to breathe through the larynx. About the middle of January, 1883, he had no further advanced; he almost immediately became cyanosed when I placed a finger lightly over the opening of the tracheotomy tube, and he could breathe after removal of the tube only as long as the tracheal opening remained patent. The above described tube was used, and after a few weeks he was able to cry lustily, and to say "Nurse," "Yes," "No." When the opening of the tracheotomy tube was wholly closed, he could pass the day comfortably with the tube wholly closed, and could sleep at night with the tube almost closed.

The question remains as to how the tube acted in the above cases. The object was so to screw down the cap as to maintain an ever-increasing degree of deoxygenation of the blood, and by this means to educate the laryngeal nervo-muscular apparatus to open the glottis for inspiration. This may be the *rationale* of these cases, but whether so or no, the probability remains that the instrument was directly concerned in the cure of the first case and in the great improvement of the second.

Thus far I have tacitly assumed that the difficulty is owing chiefly to loss of nervo-muscular energy or coördination, or to both. But should stiffness of the joints of the larynx enter into our computation? I am inclined to think that it should, for manipulation of the larynx certainly seems to aid us in the cure of these cases, as it serves in the cure of stiff joints generally. Dr. Lauder Brunton, however, kindly suggests that such effects may be due to the influence of "massage." Would diphtheritic paralysis of the larynx contra-indicate the use of such a tube? Diphtheritic paralysis apparently does in some cases affect the nervous or the muscular portion of the laryngeal inspiratory mechanism, for we frequently see fluids pass down the trachea during drinking in diphtheritic patients who have been tracheotomised; indeed, we have heard of death being due to asphyxia therefrom resulting. I feel that the tube is also applicable to these cases, but that we should exercise great caution during its use in order not to obliterate the holes too quickly. Electricity would also seem to be indicated in these cases. With regard to the working of the apparatus here described, I may say generally that it is easy, careful and constant attention being, however, a *sine quâ non* for success.

## SCARLET FEVER.

A REMARKABLE SERIES OF CASES, AND A NOTEWORTHY  
END OF IT.

By E. DIVER, M.D., M.R.C.S.

ON Nov. 21st, 1880, my attention as medical attendant to a school of about 250 children was called to a girl with a rash, which I found to be that of scarlet fever. No information was forthcoming as to whence she got the disease. She was removed to the infirmary—a building in all ways isolated from the school; the room in which she had been temporarily placed was scoured and cleansed, and a good look out amongst the children was kept up. In ten days another girl had scarlatina, and she was removed to the companionship of the former. Three weeks passed with no fresh case, but on the twenty-fifth day another girl had to be taken to the infirmary. We were free again until the twentieth day, when another girl showed signs of scarlatina, and was removed like the three others. In seventeen days more, three cases occurred together, all girls; in fifteen days from these, another girl; in twenty-eight days more, two girls; in ten days after these, another two; and in twenty three days more came the thirteenth girl, and the last of the series. After the tenth girl got ill, the disease showed itself in one of the boys, and I wondered whether we were now to have a regular epidemic. But time proved that this boy was the only one to be ill, and he turned out to be the brother of the sixth girl. It was proved, too, that his mother had seen and kissed him after having gained an interview with her convalescent daughter forty-two days after this girl's illness began. Ten days after the mother's visit the boy complained of a sore-throat. After each removal of a patient or patients to the infirmary, the interval was anxiously watched, and once or twice we began to think we had done with the disease. But on being disappointed we were puzzled to account for its recurrence. There was no probability of infection from the old cases, and we knew of no scarlatina elsewhere in the neighbourhood. The limited spread of the disease was against its being brought into the school with any sort of food, and all the water was pumped from a deep well. The drainage was almost entirely by earth closets, and there was no overcrowding, the dormitories being ample and well ventilated. At length I examined the water cisterns. These were situated in the roof of the building, and I traced each pipe going from them. One I found went to a dormitory, and terminated in a tap from which the girls on going to bed could draw water; and I ascertained that all the sick girls had drunk from this

source; probably many others had done so, too. The overflow pipe from the same cistern had its orifice of discharge over a gully in the corner of a paved yard, the orifice being parallel with the gully, and an inch or two above it. Side by side with this pipe, and terminating at the same level, was another. This other led down from a slop sink, and conveyed the night urine from the girls' dormitory into the drain. These pipes had been in use for two years, as had the portion of the school wherein the disease occurred and to which they belonged. The drain, which was trapped below the gully by a Doulton's siphon, conveyed also rain water and bathroom water to the larger drain beyond, and the gully grating was somewhat furred with urine salts. Now, whether the structural arrangement described had anything to do with the scarlatina or not, it was clearly a bad one, and open to grave suspicion. The overflow pipe was therefore cut away to half its length on March 26th, 1881, nine days from the last case of illness, and was made to discharge itself upon a low roof hard by, thus dissociating it from the urine-pipe, which in its turn had its extremity cut into the shape of a jug spout. After this no case of fever happened.

Owing to the circumstance that no ordinary cause of the disease was discovered, as contagion or fomites, it seems probable that there was some less common cause for this series of cases of scarlatina. If so, either it was one of which I am not cognisant, or it was connected with the juxtaposition of the two pipes. In the latter case, the overflow pipe appears to have conveyed to the cistern, upon Tobin's principle of ventilation, air, with all that air may carry, and the chemical results of some decomposition of urine and perhaps of other fluids; and by this contamination the water was made equal to the production of scarlatina at uncertain intervals, depending partly upon the receptivity of those who drank of it. Arguing upon this, one's question next is, What is this chemical which was conveyed from the urine pipe, or perhaps, but unlikely, from the comparatively harmless drain below? For, so far as can be told, no ordinary scarlatina germs were present, the facts appearing to favour the theory that scarlet fever may be generated *de novo*.

As to the case of the boy, he had no means of getting at the water which the girls drank from, and I know of no way in which it was probable he took scarlatina, except it be admitted that his mother brought it to him. But if she did, the period of apparent incubation was of unusual length. It may be, however, that the poison lay in his clothing for a day or two, and so the ordinary period of incubation may not have been transgressed. But if the boy's mother did not bring the disease to him, and the girls did not get it by means of the pipes, then the facts given exemplify what is undoubtedly true sometimes, that with all the circumstances seeming to favour a given conclusion that conclusion is not correct, because an important something else has needed recognition. Query, In the present case, is there this something else? And if there is, what is it? But if not, what was the seed of mischief in the water?

Kenley, Surrey.

## A Mirror

OF

## HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

### MIDDLESEX HOSPITAL.

#### TWO CASES OF TRAUMATIC ONE-SIDED PALSY OF SPINAL ORIGIN.

(Under the care of Mr. HULKE.)

CASES of this kind seem to be rare. In the first case the lower, in the second the upper limb was affected. In both the motor palsy was of much greater intensity and of longer duration than the loss of sensation, a coincidence which may find its partial explanation in the greater complexity of motor function. The implication of both motor and sensory functions would suggest a lesion of the nerve cords beyond

the junction of their motor and sensory roots, and would locate in the second case the injury outside the intervertebral foramina. The widespread convulsions, however, in this case point to a more centrally seated injury, to an excessive strain falling principally on the anterior roots and their ganglionic connexions, and to a widely spreading irritation. In the first case the lesion was considered to be probably hæmorrhage into the anterior grey cornu.

CASE 1. *Palsy of Left Lower Limb from a fall.*—On March 16th, 1882, at 11.30 A.M., a short, extremely stout carman, aged twenty-eight years, was received into Broderipp ward for injuries received a few minutes previously in a fall from his driving-box, in which, it was said, his loins had struck upon the pole or splinter-bar of the van. When extricated from between the horses it was found that he was unable to stand in consequence of want of power in his left leg. Upon examination half an hour after the accident there were noted absolute motor palsy of the left leg and thigh, great insensibility to tactile stimulation as high as the knee, and absolute insensibility of the surface of the scrotum, and integument of the penis, on both sides of these latter parts. No reflex movements could be excited in the limb. Retention, requiring the use of the catheter, was also shortly afterwards observed. On the following day the anæsthesia of the scrotum and penis had disappeared, and that of the leg was much less. Defecation occurred without consciousness of the act. Notwithstanding precautions to avoid septic infection of the bladder by the catheter, acute cystitis supervened on the third day after the injury. Urine, alkaline and bloody, was voided occasionally without consciousness of the occurrence, but when the catheter was used, as the emptied bladder contracted upon it he suffered very great pain. This was so severe—he called it agonising—that a hypodermic injection of morphia was required daily during several weeks. Later, retention was replaced by stillicidium, which was not the dribbling of an overfilled viscus, but it was due to loss of tone of the sphincter vesicæ; for catheterisation proved that the urine escaped per penem as quickly as it entered the bladder through the ureters. On May 15th, a few months after the accident, he had a severe gastric attack, marked by severe pain in the region of the stomach and vomiting. This yielded to bismuth and prussic acid. Two days afterwards acute inflammation of the left testis supervened. The left lower limb by this date had become very cedematous, the surface was pale, the epidermis thickened and opaque. His state varied little from day to day, but in the course of June and July a marked improvement had taken place. By the end of the latter month he was able to flex and extend the hip, knee, and ankle-joint through a considerable angle, and he had regained some power over the toes. The improvement was more rapid after he was able to be dressed and wheeled about in a chair, and it was yet greater when, with the aid of crutches and supported by a couple of assistants, he began to try to walk. When last seen, about a month ago, he walked with crutches only, and did not need any longer the assistance of others, and the improvement of the limb was so considerable as to warrant hopes of the recovery of a useful limb. The paralysis of the sphincter vesicæ and unconscious defecation continued. The treatment consisted mainly in measures tending to maintain and improve the nutrition of the palsied limb—e.g., shampooing and faradisation. Much care was required to avoid the formation of pressure sores.

CASE 2 *Violent general Convulsions and Motor Palsy of the Left Upper Limb, caused by a severe Squeeze of the Neck; Recovery.* (From notes by the dresser, Mr. C. E. Faunce.)—On March 10th, 1881, a factory boy, aged sixteen, while in the act of stooping over a rail and looking down the well of a lift, was caught across the neck by the cage in its descent, and thus held imprisoned until the jammed-tight cage was lifted with a crowbar sufficiently to allow the extrication of his head. Insensible and violently convulsed, he was immediately brought in a cab to the hospital. On undressing him it was found that he had voided urine and fæces. The convulsions soon ceased, consciousness returned slowly, and was not completely restored until night. The left upper limb was completely paralysed as regards motion, but the sensibility of its surface was only slightly if at all impaired. The left pupil was contracted; the left cheek and the right forearm were noticed to be slightly grazed, and the right side of the neck seemed to be a little swollen.