

referred to kinking of the portal vein. The œdema of the legs may similarly have been due to a partial occlusion of the inferior vena cava from traction. Another point of interest is the position of the liver after death, in no way corresponding to the ante-mortem demarcation. The same circumstances led Wickham Legg<sup>3</sup> to disbelieve the existence of true hepatoptosis, except in mistaken diagnosis. Packard,<sup>4</sup> however, records a case in which before death the liver edge reached from nine to ten centimetres below the costal margin and post mortem it was in its normal position under the diaphragm and almost hidden by the costal cartilages. Landau<sup>5</sup> likewise points out that the diagnosis of hepatoptosis has not been conclusively established by necropsy. Yet the condition is only to be expected with the ascent of the diaphragm that occurs at death; and the reality of hepatoptosis has been confirmed both by abdominal section and post-mortem observation. It is difficult to say whether the descent of the liver was, as Glenard holds, merely a terminal incident of a general enteroptosis. No such condition was discerned either before or after death, but the readiness with which the intestines wandered into the left flank, and the existence of an inguinal hernia on the left side suggest such a possibility; also the liver, though so extensively displaced, was very slightly mobile apart from the intestines. On the other hand the stomach was normally situated and there was no associated mobility of the kidneys. Glenard mentions albuminuria and leucorrhœa as conditions associated with hepatoptosis, and both were present in this case, but the albuminuria may well have been a secondary effect of the jaundice, and though leucorrhœa may be a sequel of enteroptosis it can hardly be a direct sequel of hepatoptosis.

In any given case it is difficult to assign the exact causation to a moveable liver: in this case the abdominal walls were remarkably pendulous. Landau regards this as the main cause of hepatoptosis, and Graham<sup>6</sup> found a distinct relation to frequent pregnancy at short intervals, nearly all cases of non-traumatic origin occurring in women. The intestines act as a cushion which supports the liver in its position under the diaphragm by the even pressure of healthy abdominal muscles. But obviously flaccid abdominal walls do not alone produce hepatoptosis, as the former condition is very common, the latter very rare. Graham showed in the cadaver that, in the ordinary way, the ligaments were strong enough to carry the whole weight of the liver without the abdominal walls: simple opening of the abdomen seldom induced any descent of the liver. He also found that after opening the abdomen and cutting the suspensory ligament the anterior border of the liver descended about three inches, the right lobe more than the left, while the posterior margin remained fixed. This would necessarily produce anteversion such as occurred in the present case; yet post mortem we were unable to make out any elongation of the suspensory ligament, such as might result from increased traction by loss of the support of the abdominal walls. Winkler<sup>7</sup> supports the theory of elongation of the suspensory ligament, and Wassilief<sup>8</sup> has actually seen such a condition. It must be borne in mind, however, that there is no proof that this ligament is normally tense in the healthy subject. In my case there was no mesohepar, which, according to Hirtz, exists only in Meissner's imagination, and the other ligaments appeared perfectly normal. Faure<sup>9</sup> is disposed to regard the coronary ligaments and the connective tissue investment of the inferior vena cava as the true suspensory ligament of the liver; this would harmonise with the clinical condition of our case, the general descent being due to weakness of the coronary and lateral ligaments, the right lobe by reason of its greater weight descending first and most. Faure attributes the lengthening of the ligaments to a general nutritive defect leading to stretching of the fibrous tissues generally, and so causing both flaccidity of the abdominal walls and weakness of the ligaments. Descent of the liver has been laid to the charge of tight lacing, but this phantom tends to crop up whenever a disorder is specially incident on the female sex. Whatever may have been her habits in the green tree, there was no indication of such a cause in the sere and yellow leaf; moreover, as

Graham remarks, tight lacing leads to errors of form rather than of position of the liver.

In most of the recorded cases, as in this, the onset of the symptoms has been insidious; sudden onset is usually, but not always, traumatic, and is marked by the familiar symptoms of severe biliary colic. There has usually been dull aching pain, worse on exertion; my patient referred her most constant pain to the lower part of the back and between the shoulders, and described it as dragging. Pain and tenderness over the liver only became a prominent feature in the late stages, when the œdema present must have exerted a great distending force on the liver. The intense general abdominal pain of the later stages was probably referable to the recent peritonitis, which was found over the spleen. The dragging pain was always worse on exertion, but not completely relieved by recumbency.

The histological characters of the liver are peculiarly definite. The most striking feature is the widespread atrophy of the liver cells; apparently this is not a purely mechanical process, as the atrophy is equally marked away from the distended bile-ducts as in their immediate environment. No doubt the degree of œdema manifested under the microscope would have greatly generalised the pressure, but much of the atrophy is probably due to icteric necrosis. It is surprising that so extensive a cellular atrophy should not have led to some degree of secondary connective tissue overgrowth, but such is conspicuously absent, only the most delicate capillary network being visible between the residual liver cells. Such a condition would suggest a somewhat rapid atrophy of the true liver cells. The limitation of the increased fibrosis to the bile-ducts is in this case indisputable. Respecting the œdema it must be borne in mind that not only was the *vis a tergo* diminished by the assumed constriction of the portal vein, but likewise a block may have existed ahead from traction on the hepatic vein or the inferior vena cava. It is true that much of the lymph drainage of the substance of the liver passes out at the portal fissure, and may have been involved in the local torsion, but obviously there must have been other channels of efflux patent or jaundice could not have occurred. Weber<sup>10</sup> surmises that the fibrosis about the bile ducts is due to organisation of scavenger cells that have been attracted to the part by the necrosed liver cells. This can hardly apply to the present case, as the atrophy is uniform and universal, while the fibrosis is strictly localised to the bile-ducts. Weber quotes some experiments of Nasse to show that the effect of ligature of the hepatic duct is to cause atrophy of the liver cells, and that if the obstruction be removed the liver cells are capable of undergoing some degree of regeneration. Of the former proposition there can be no doubt, but in the present case the persistence of the obstruction precluded a confirmation of the latter.

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## ADMINISTRATION OF ANÆSTHETICS THROUGH A TRACHEAL WOUND.

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In March, 1887, I published in the *Edinburgh Medical Journal* a short paper upon Preliminary Tracheotomy as an Aid to Certain Operations. In this communication I described and figured a simple appliance for keeping a patient under the influence of chloroform or ether in connexion with operations which necessitated a previous tracheotomy. Since then I have used this appliance from time to time with success, but having found that the india-rubber tube connected to the tracheotomy tube was sometimes apt to get twisted at its point of connexion and so interfere with respiration, and also that matters coughed up were not readily expelled through the long tube, I have had my apparatus improved so as to lessen these risks. This modified appliance was recently employed with perfect success in a case of excision of the entire larynx and portion of the trachea together with a large and vascular thyroid tumour, the patient being now quite convalescent.

This improved apparatus is as follows:—1. An ordinary full-sized silver tracheotomy tube having its upper end extended

<sup>3</sup> St. Bartholomew's Hospital Reports, 1877.

<sup>4</sup> Transactions of College of Physicians of Philadelphia, 1896.

<sup>5</sup> Deutsches Archiv für Klinische Medizin, 1875, Band xiv., Heft 1.

<sup>6</sup> Transactions of the American Association of Physicians, 1895.

<sup>7</sup> Zur Casuistik und Aetiologie der Wauderleber, Archiv für Gynäkologie, 1872, Band 4, p. 145.

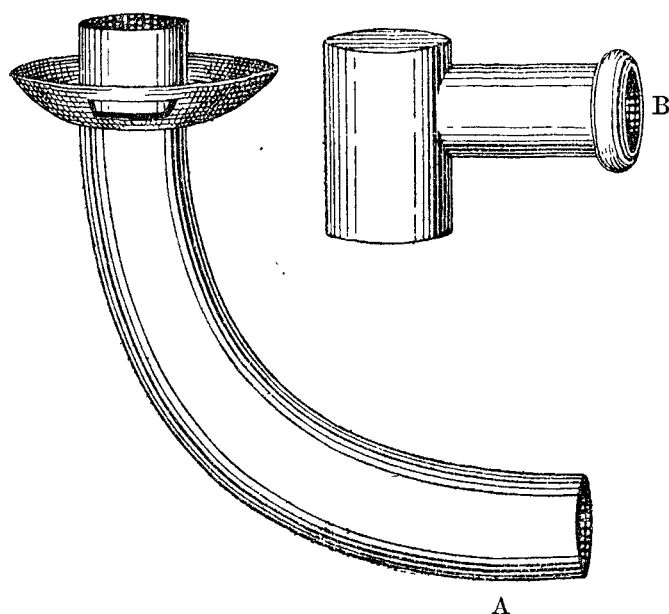
<sup>8</sup> Wiener Medicinische Blätter, 1880, No. 30, p. 785.

<sup>9</sup> Thèse pour le Doctorat en Médecine, Paris, 1892.

<sup>10</sup> Brit. Med. Jour., vol. i., 1896.

for about half an inch beyond the shield (see Fig. 1, A); 2. A silver cap (Fig. 1, B), having a short tube of the same metal projecting at right angles from it and to which one end of an indiarubber tube is connected. In Fig. 2 is shown the cap fitted on to the tracheotomy tube. The cap fits easily and can be at once lifted off the tracheotomy tube and also turned round so as to allow the attached indiarubber tube

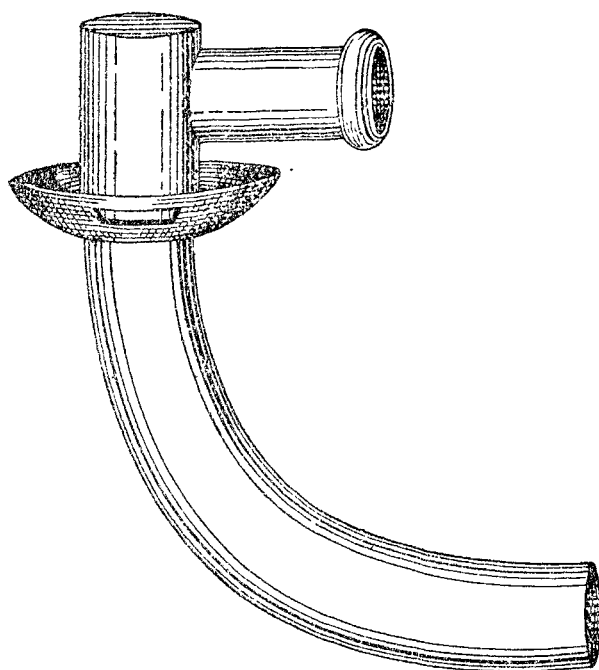
FIG. 1.



Tube with cap disconnected.

to project on either side which ever may be found most convenient for the administration of the anæsthetic. 3. A portion of indiarubber tubing. The length of this should be about two feet, but it may be used shorter or even a little longer, and the diameter I prefer is about half-an-inch. 4. An ordinary glass tumbler or other similar receptacle with a small piece of lint or absorbent wool placed at the

FIG. 2.



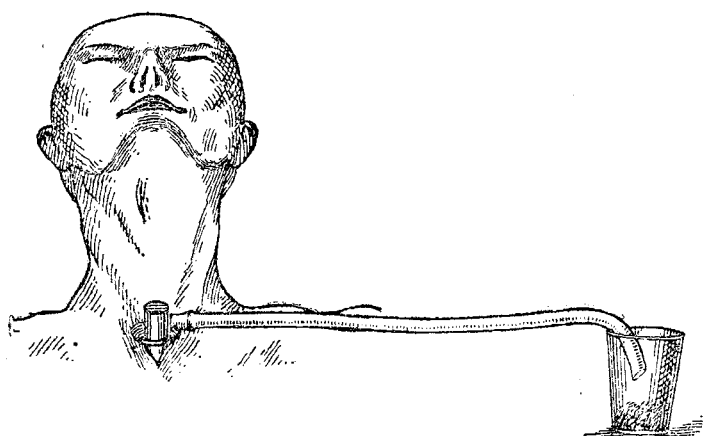
Tube with cap in position.

bottom upon which the chloroform or ether is from time to time sprinkled. In Fig. 3 the whole apparatus is shown in position.

The anæsthetic—I prefer chloroform—may in the first instance be held over the tracheotomy tube with the cap off, and when the time for the operation has come the cap with attached indiarubber tube is put on and the anæsthetic inhaled from the tumbler, the anæsthetist standing or, if he prefers, sitting well away from the operating table, holding the tumbler in one hand and with the other steadying the tube. To prevent blood or vomited matters passing into the air-passages during the operation the introduction of a piece of sponge or other plug into the trachea above the tracheotomy wound is usually satisfactory but in the case of the

excision of the entire larynx already referred to I adopted a thoroughly effective and as far as I know original method and I am inclined to think that this plan may be used in other cases. The procedure was to pass round the trachea immediately above the tracheotomy wound an indiarubber cord and by means of it to ligature the canal temporarily so as completely to prevent the entrance of any fluids or other matters into the air-passages. When the ligature was removed at the completion of the operation above referred to the walls of the trachea did not appear to have been injured by it. It is true that the condition of the tracheal rings in some instances might prevent such a ligature being perfectly

FIG. 3.



Cap connected with indiarubber tube dipping into vessel containing wool and anæsthetic.

effectual, but I am of opinion that this means of temporarily closing the trachea is worthy of consideration and trial.

The advantages, then, claimed for the appliance which I have figured are: 1. It is simple and at the same time effectual. 2. The cap being moveable can if necessary be at once disconnected from the tracheotomy tube, so as to allow mucus or other matters to be more easily expelled from the air passages. This mobility also allows the cap and connected indiarubber tube to be turned round to either side. 3. It allows the anæsthetic to be administered at some distance from the patient, and so does not interfere with the operative procedure. 4. The anæsthetic when inhaled through the long tube is not likely to be so irritating to the air passages as when it is more directly inhaled through the tracheotomy tube itself.

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## CHRONIC MENINGITIS AS A SEQUELA OF EPIDEMIC CEREBRO-SPINAL MENINGITIS.

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THE following case is probably an example of what Sir William Gowers has described as chronic internal pachymeningitis due to the epidemic disease; it is not described, so far as I can discover, as an ordinary sequela, and must certainly, I think, be rare in such a well-marked form, closely resembling the form of pachymeningitis due to caries and suppuration.

The patient, a man aged twenty-one years, always healthy but for this trouble and with a good family history, had an attack of cerebro-spinal meningitis during a severe epidemic at the Cape in 1877.<sup>1</sup> He had one relapse within three weeks, but otherwise recovered well, though there was a distinct history of impaired vision during convalescence, from which he gradually recovered. After that he was in good health up to fifteen years of age and led an outdoor life, joining in athletics and playing football. At about the age of fifteen years he began to notice pain in the left hip which at first only came by day and after exertion, but latterly was most severe at night. For two years this

<sup>1</sup> Hirsch (Geographical Pathology, vol. iii) asserts that there have been no outbreaks in the southern hemisphere, but I believe there is sufficient evidence as to the occurrence of this one.