obligations to those gentlemen who have kindly placed at my disposal their microscopical collections for the study of various neoplasms, innocent and malignant, bearing upon the subject of this paper. To Mr. Shattock and Dr. Lazarus-Barlow for this facility, and for the enjoyment of many discussions upon the histology of bleeding polypus of the septum and its allies, my thanks are especially due. The latter gentleman has kindly looked over the proofs with me. I wish also to include the names of Dr. H. D. Rolleston and Dr. R. S. Trevor of St. George's Hospital for access to their valuable collections. To those members of the Laryngological Society of London who have contributed specimens to the cabinet of the society or have lent slides to me from their private collections for examination and for reproduction by the artist I wish to accord my warmest thanks; their names are duly recorded in connexion with their cases in the table, and the illustrations in the text. With regard to these, the excellence of the artist's (Mr. Taylor's) work speaks for itself, and I wish to express my indebtedness to the Editors of THE LANCET for their profuse liberality in displaying them.

BIBLIOGRAPHICAL REFERENCES AND COMMENTS.

(*1*) Verneuil: Annales des Maladies de l'Oreille, 1875, quoted by Morell Mackenzie, vol. ii., p. 384. (*2*) Roe: Transactions of the American Medical Society, 1885. Classical Essay on "Nasal Angeiomata," with table of 14 cases. Three or perhaps four of these can be recognised as falling into the category of bleeding polypus of the septum. (It can be consulted in the library of the British Museum.) (*3*) Moure: Manuel Pratique des Maladies de Fosses Nasales. 1886. It contains a short chapter, excellent for the time of writing, on erectile tumours; it is influenced by Verneuil's paper. (*4*) Victor Lange: Copenhagen, Wiener Medicinische Presse, No. 52, 1892. A paper now historical, much quoted by German writers; it contains a narration of six cases and attempts to establish a preference of bleeding tumours for the left side of the septum. Of 17 cases within my knowledge 12 grew on the left side, five on the right. According to Hasslauer, Lange has the credit for the earliest description of these growths, "though Tsakvroglous (Monatsschrift für Ohrenheilkunde, 1887) has described one but not interpreted as such." (*5*) Luc: International Centralblatt für Laryngologie, 1892, S. 9; a description of a teleangiectatic myxangioma. (*6*) Schadewaldt: Archiv für Laryngologie, 1893, Band I. Three cases, here first designated "Blutende Septum Polyp," described in a paper before the Laryngological Society at Berlin, July 14th, 1893. (*7*) Alexander: Archiv für Laryngologie, Band I., 1893. Alexander, Scheier, and Heymann, and Schwäger each published cases of Bleeding Tumours of the Septum; and Schwäger six cases of Angeioma of the Nasal Mucous Membrane (inferior turbinal) in this volume of the Archives. (*8*) Natier: Annales de Polyclinic de Paris, 1893: "Trois cas de Polypes saignants de la Cloison." I regret not being able to see this paper. (*9*) Garel: Annales des Maladies de l'Oreille, February, 1893. A case of "true angeioma." (*10*) Cobb: Boston Medical and Surgical Journal, 1893; and Transactions of the Pan-American Congress, vol. xxx., 1895. A genuine case described at the Congress in 1893 as Cavernous Angeioma of the Septum. Cobb gives many valuable references to past literature in this paper. (*11*) Strazza: Revue Internationale de Larvngologie, March, 1894, described a case of cavernous angeioma. (*11a*) Seifert and Kahn: Atlas der Histopathologie der Nase, 1895, figuring a fibro-angeioma from the middle turbinal, a cavernous angeioma rom the inferior turbinal, and a bleeding polypus of the septum, with descriptive text. (*12*) Sendziak: Kronica lek., 1895, translated in the Journal of Laryngology, March, 1896; important description of a case with valuable references, but apparently uninfluenced by the German literature of 1893 and 1894. (*13*) Lubliner: "Medicina," 1894; a description of a "fibroma telangiectodes." (*14*) StClair Thomson: Proceedings of the Laryngological Society of London, vol. iii., January, 1896. This was the first case described in the proceedings of the society; it was followed in November of the same year by Dr. J. W. Bond's case; the remaining cases will be found in sequence in the table published in THE LANCET of last week (p. 1459) with the former portion of this paper. (*15*) Glasgow: Journal of the American Laryngological Society, 1897. Case of Angeiofibroma of the Septum, described and figured by C. Fisch; the structure of the arterial system is stated to be "throughout normal," which does not accord with the usual experience. (*16*) Walliczek: Monatsschrift für Ohrenheilkunde, 1897. I only know this paper, in which the classification detailed in the text originated, through Roth's reference. (*17*) Pearce, Norval H.: Journal of the American Medical Association, February, 1898. An account of two cases in patients aged respectively five and 15 years, followed by an interesting discussion. (*18*) Hasslauer: Archiv für Laryngologie, 1900. Innocent Tumours of the Nasal Septum; Section III., Bleeding Polypus, with table of 55 cases; the first comprehensive paper of its kind that I am acquainted with, and to which further references will be found. (*18a*) Heymann: Handbuch der Rhin., Band iii., 1900. (*19*) Shurley: Diseases of the Nose and Throat, 1900. An observation is made in this treatise (p. 537) under the description of nasal papillomata, which has arrested my attention, and not fully understanding it I refer to it here. Shurley says: "The soft or what is called by some the 'mulberry papilloma' or 'angioma' on the other hand is of very rapid growth and shows quite a tendency to spread. This is why some observers have considered it malignant. On account of their site, which is within the vestibule of the nose, Seiler and others have believed that the most common cause of their origin is external irritation." The author then gives a short description of "true angeiomata or erectile tumours," of which he states that cases have been reported by Wagner, Glasgow (an angeiofibroma), Delavan, Roe, Jarvis, and Casselberry; also that Seiler has collected the reports of ten cases. He also records that Dr. George Godson reported a case of false angeioma due to a blood-clot as proved by microscopic examination, which afterwards underwent absorption. Shurley's illustration is a reproduction of Fisch's drawing of Glasgow's case. I am indebted to Dr. Shurley for the above references. (*20*) Krieg: Atlas of Diseases of the Nose, 1901. Nine cases admirably illustrated macroscopically with excellent descriptions in the text. This atlas was shortly followed by Gerber's, in which two cases are figured and described. (*21*) Grünwald: Atlas of Diseases of the Mouth, Pharynx, and Nose, translated and edited by Newcomb, 1903. Bleeding polypus of the septum is mentioned under Granulomata (p. 165): If by round-cell tissue is meant lymphoid tissue my experience on this point, as well as others in this reference, does not accord with Dr. Grünwald's. (*22*) Reichert: Archiv für Laryngologie, Band iii., 1903. On a Case of Bleeding Polypus of the Septum. (*23*) Baurowicz: Archiv für Laryngologie, Band iii., 1903, p. 451. A short paper dealing with the Etiology and Clinical History of Bleeding Polypus. (*24*) Roth: Archiv für Laryngologie, Band xvi., Heft 3, 1904. On a case of Bleeding Tumour of the Septum from Professor Paltauf's Pathological Institute. A brochure which, like that of Hasslauer, will be found to be of great value to students of this subject. With but few exceptions this brief *résumé* indicates the authors of clinical papers only. As regards the text-books in the English language, the references to nasal angeiomatous growths are somewhat meagre and many omit them altogether. In text-books on special pathology they are hardly ever alluded to. The Proceedings of the Laryngological Society are published by, and obtainable from, Messrs. Adlard, Bartholomew Close. They are also reproduced in the *Journal of Laryngology* after each meeting.

PS.—In the first part of this paper, Nov. 18th, in Case No. 11, the growth should have been stated to occur on the left side of the cartilage. On p. 1458, right hand column, line 19 from top, for "sometimes indistinguishable from," read *which is apt to be mistaken for*

Harley-street, W.

ETHYL CHLORIDE AS AN ANÆSTHETIC FOR INFANTS.

BY FLORA MURRAY, M.D. DURH.,

SENIOR RESIDENT MEDICAL OFFICER TO THE BELGRAVE HOSPITAL FOR CHILDREN, S.W.

A CONSIDERABLE amount of literature has been published dealing with the advantages of ethyl chloride as a general anæsthetic. Opinion seems agreed as to its merits where older children are concerned but disinclined to advocate its use for very young infants. Having used it as a general anæsthetic for infants of all ages I have come to regard it as one of the best means of procuring an anæsthesia of from five to 15 minutes, such as is required in an out-patient or surgery practice. It appears to be as safe and suitable for babies as for older children and it does not produce bad after-effects. Among the deaths recorded from this anæsthetic only very few have occurred in children and none in young infants. I have administered ethyl chloride to 150 infants under a year old; for the purposes of these observations no cases above that age have been included. The youngest cases were five and 14 days respectively and a large proportion of them were from five to seven weeks old. Many of them had not undergone any preparation at all and the only precaution taken with regard to the others had been to withhold food for some hours that morning. They included numbers of the weak and ill-developed children common to hospital out-patient departments. Ethyl chloride may be used equally well for major and for minor operations, but its use in prolonged operations is hardly to be recommended, partly owing to the waste of the drug by evaporation and partly because it has no special advantage over chloroform and the A.C.E. mixture when a narcosis of from 20 to 40 minutes is required. For minor surgery, where one is anxious to shorten the period of recovery and let the child go home as soon as possible, it is invaluable.

It is a successful anæsthetic in cases of respiratory embarrassment. I prefer it to any other for empyemata and the relief of pharyngeal abscess in babies; it is also very suitable for tenotomy, sounding, circumcision, and the removal of adenoids, lipoma, polypi, dermoids, cysts, or nævi. For most of these operations the surgeon is satisfied with an anæsthesia of 10 or 15 minutes, and if that length of time is insufficient it is a simple matter to prolong it a little. When there is much work to be done the short time necessary for induction is a distinct gain to the operator as well as to the infant. The simplest form of inhaler is the best to use; a useful one consists of an ordinary shaft on to which the face-piece and bag fit; the free end is closed by a stopper attached by means of a fine chain and the anæsthetic is sprayed through this opening. To the end of the shaft which enters the bag two curved wires are fitted, so adjusted

as to make a little cage in which a small sponge is placed. When ethyl chloride is sprayed into a bag of the usual size part of it vaporises and the other part tends to fall to the bottom and to vaporise as the patient breathes in and out. A young infant does not make a sufficient respiratory effort to produce the necessary amount of vaporisation and for this reason induction is often unduly delayed and the anæsthesia is not smoothly maintained. The sponge inside the bag intercepts the anæsthetic and by holding it nearer to the child obviates these defects, making it possible for the patient to inhale it more rapidly and without effort. The same result is obtained if a bag of about half the usual size is employed, but it is not always convenient to change the bag between the cases.

A celluloid face-piece is generally preferable since it not only permits the anæsthetist to observe the patient more readily but also resists the action of the vapour better than rubber. For infants of a few days or a few weeks old I commence by spraying three cubic centimetres into the inhaler; for those of six months and upwards I give five cubic centimetres at once. The mask is then approached to the face but not pressed against it so that the baby has several breaths of air and vapour mixed; it is then more closely applied so as to exclude all air except that which is already in the bag, and in a few seconds the child becomes unconscious. When one is sure that the anæsthesia is deep and the surgeon has made his incision or begun the operation the mask should be removed from the face and a few breaths of air should be given. If it is desired to continue the period of narcosis for some time the mask should not be kept off for long but only raised occasionally for air. If the respiration indicates the lightening of the narcosis a few more cubic centimetres may be added to the bag; on these lines the anæsthesia may be indefinitely prolonged. I think it is desirable that the induction should be as quiet as possible and for this reason I dislike to have the child much restrained. All that is necessary is that the nurse or attendant shall prevent the child from clutching the face-piece or bag, otherwise free movement of the legs and arms does no harm. Physical restraint is annoying to the infant and adds to his excitement; in older children it produces terror. Respiration is the most certain guide as to the depth and duration of the anæsthesia; it should never be disregarded. When the patient is well under it is quicker than is normal, deep, rhythmical, and often stertorous; when he is coming out it becomes softer and more shallow; when an overdose has been given it suddenly changes in character and from being full and deep becomes very soft and short, then after a breath or two ceases altogether. The pulse is usually hastened but in many instances there is no appreciable difference. The corneal reflex is abolished very early; the pupil in infants is so uncertain that it cannot be considered as a sign of any value. In older children it seems always to dilate; in babies it may be contracted or dilated, and I have observed it also to alter more than once during the same anæsthesia without being able to give any reason for the variation. The secretion of mucus, especially when the anæsthesia is prolonged, is not so frequent among children in their first year as among older children. I have had two cases in which it caused inconvenience; both children were cutting teeth and had increased salivation at the time. No fatalities occurred among these infants but four of them stopped breathing during the administration. This happened when I had comparatively little experience in the administration of this particular anæsthetic. Since I have adopted the method of giving plenty of air I have not had any difficulties. These four cases occurred during the operation for phimosis, during which a deep anæsthesia is desirable. Two of the patients were vigorous and healthy children and it is possible that they were not sufficiently deeply anæsthetised and that the suspension of respiration was due to surgical shock; the other two were weak and feeble infants under four months old and the cause remained uncertain. In one case respiration was suspended before the operation, which was subsequently successfully completed, had been begun. Animation was restored by the application of brandy and friction to the lips; and though in two cases the tongue was drawn forward and artificial respiration was resorted to there was never any real difficulty in reviving them and it was always possible to finish the operation.

Infants probably suffer less than any other class of patients from after-effects. After a small dose they become conscious at once; after a large one they sleep for 10 or 20 minutes, unless they are in pain when they rouse up sooner. At this age vomiting and convulsions as the consequence of the anæsthetic do not occur, and the food which the mothers are apt to press upon the infants as soon as they have been restored to them does not seem to cause them any ill-effects. Unless they are in much pain they are fit to be dressed and removed from the hospital in from a quarter to half an hour. I used ethyl chloride in one case of intussusception; the child, aged six months, was very ill and reduced and did not require much of the anæsthetic. The actual operation lasted 20 minutes, the administration 23 minutes, the amount of the drug used was 15 cubic centimetres, there was no preliminary struggling, the abdomen was well relaxed, and the anæsthesia was perfectly easy and smooth, the child recovering from it almost at once without any vomiting or other unpleasant after-effects. In this case ethyl chloride was chosen with a view to shortening the narcosis.

One of the principal factors in producing shock in children is the length of the anæsthesia; by using ethyl chloride the periods of induction and recovery are so much shortened as to make an appreciable difference to a patient in a bad condition. It is probably the easiest and pleasantest anæsthetic to inhale. The smell of the drug is not obtrusive and it is such a strong respiratory stimulant that the patient does not require to make any effort; on the contrary, it promotes respiration against his will. Herein lies its chief danger, for if large doses over-stimulate the respiratory centre and cause a tonic contraction of the diaphragm the patient may die from paralysis of the respiration. This event is liable to occur soon after induction, the heart remaining unaffected.

The alternative anæsthetic for babies is chloroform and its mixtures, which entail a certain amount of risk for very young and very weak infants. The depressing action on the heart, the tendency to vomit or retch during induction, and the excitement produced add to the ordinary risks in these cases. The length of the narcosis and especially of the recovery period are serious disadvantages and the danger of confiding these children to the care of an inexperienced guardian afterwards is considerable. At this age ethyl chloride is not liable to cause vomiting or retching and the period of excitement is reduced to a minimum. Further, there is practically no risk in sending the children away in unskilled hands, all of which advantages will no doubt tend to popularise its use for infants.

Belgrave Hospital for Children, S.W.

TWO CASES OF SPASM WITH HYPERTROPHY OF THE PYLORUS IN INFANTS CURED WITH OPIUM.

BY NEWMAN NEILD, M.B. VICT.,
ASSISTANT PHYSICIAN TO THE BRISTOL GENERAL HOSPITAL.

THE theory of the causation of the so-called congenital hypertrophic stenosis of the pylorus which has obtained the most support is the theory that the hypertrophy is the rapidly acquired result of frequently recurring spasm of the pylorus. The following two cases appear to lend a further argument in favour of that theory. The question as to the causation of that spasm is still a matter for conjecture.

The first case was that of an infant, aged five weeks, brought to me at the Bristol General Hospital. The child was breast fed and the mother appeared healthy and had a good supply of milk. She complained that the child was wasting and vomited shortly after taking the breast. The vomiting commenced a few days after birth and the child, "a fine big baby born," began to lose flesh. As a rule there was constipation but there were occasional attacks of diarrhœa. The vomiting was usually forcible. The child was very wasted and the abdominal parietes were thin. A few slow contractions of the stomach could be made out, although the pylorus could not be felt. The last feed had been taken an hour previously and the child had been sick shortly afterwards. Three days later the child was seen immediately after taking the breast and after a few minutes there were plainly visible the characteristic gastric waves and the pylorus was distinctly palpable and appeared to be tender.