bodies absorbed from the intestines are transformed into innocuous combinations before entering the general circulation.¹

The "free sulphates" are the salts of the ordinary bases found in the urine.

The proportion in which these two groups are met with in healthy urine is said to be 10 of the "free sulphates" to 1 of the "combined," the ratio changing with varying amounts of putrefaction in the intestine. Thus an increased excretion of "aromatic sulphates" has been observed in cases of intestinal obstruction, peritonitis, pyæmia, etc.; and Dr. William Hunter has lately recorded a case of pernicious anæmia in which the proportion was considerably altered, the departure from the normal corresponding closely with the general condition of the patient. In three observations made by myself on the urine of a case of typhoid, the average ratio of "free" to "combined sulphates" was as 4 to 1.

Conversely Baumann, by clearing out and disinfecting a dog's intestine with calomel, has caused the "aromatic sulphates" to disappear entirely from the urine.

The particular point to which, at Dr. Hunter's suggestion, I directed my attention was the effect of different diets on the excretion of these bodies. The method employed was that of Salkowski, which consists in dividing the sample of urine into two portions, and in one precipitating the "free sulphates" at once with a solution of barium hydrate, while the other portion is first boiled with strong hydrochloric acid to split up the "combined sulphates," both forms being then precipitated by a mixture of baryta water and barium chloride. The two precipitates are filtered off, washed, and ignited, the ashes are weighed and give respectively the amount of "free sulphates" and of "free" and "combined sulphates."

A dog whose urine was collected every day was put on a mixed diet, namely, meat biscuits, and the following results obtained:

Date.	Quantity of Urine.	Free Sulphates.	Combined Sulphates.	Ratio.
	c.c.	Grammes.		
February 8th	434	0.978	0.106	9 to 1
" 13th	420	1.386	0.105	13 " 1
" 18th	470	0.639	0.0775	8 " 1
" 20th	340	0.720	0.1258	5½ " 1

Average ratio = 9 to 1.

The dog was now placed on a diet consisting only of milk, bread, and oatmeal.

Date.	Quantity of Urine.	Free Sulphates.	Combined Sulphates.	Ratio.
	c.c.	Grammes.		
February 24th	440	0.673	0.0396	17 to 1
" 25th	410	0.776	0.0484	16 " 1
" 27th	300	0.757	0.0540	14 " 1
" 28th	260	0.824	0.0572	14 " 1

Average ratio = 15 to 1.

These tables show then that a more farinaceous diet reduced the amount of "aromatic sulphates" excreted, indicating a corresponding reduction of the amount of intestinal putrefaction, and afford a probable explanation of the advantages of an exclusively milk diet in typhoid, Bright's disease, etc.

The above experiments were carried out in the pathological laboratory of this University, and I am indebted to Professor Roy for his help and for apparatus kindly placed by him at my disposal.

In the rational treatment of this condition of increased intestinal putrefaction, we should first exclude proteids from the patient's dietary as far as possible; the bowel should be cleared out, preferably by calomel, which will also exercise its influence as an antiseptic.

There are many drugs which can be administered, either by mouth or by rectum, with a view to checking excessive putre-

faction in the intestine, but I wish here to cite a few instances only in which one, namely, β -naphthol, has proved useful. This drug, introduced by Bouchard, is an active germicide, but owing to its insolubility it can be given in large enough doses to check intestinal putrefaction without producing a toxic effect on the patient. I have occasionally known it to cause vomiting, which may be due to the hindering effect of the drug on digestion, but Dr. J. Michell Clarke has discovered that hydronaphthol exercises only a very slight retarding influence on the digestion of milk by the stomach, and has no effect on pancreatic digestion.² The β -naphthol has been used in doses of from 2 to 8 grains every few hours in 16 cases of typhoid in this hospital; its administration has been constantly followed by a lessened amount of diarrhœa, and of offensive odour in the stool. In 7 cases the abdominal distension was apparently reduced, and in 3 cases the temperature became lower by about a degree during its use. It is improbable that it exercises any influence on the local lesions, for 2 cases died of peritonitis (without perforation) who had been taking the drug to within two days of death. In cases of typhoid with constipation, I could not satisfy myself that it produced any definite effect.

Five cases of tuberculous ulceration of the bowel were treated with β -naphthol with marked benefit. In three cases it stopped the diarrhœa, in the other two it lessened it, and in all improved the character of the stools and the general condition of the patient. While in all cases it reduced the temperature somewhat, in only one did it have a marked effect, the maximum effect being usually obtained on the third day. It was tried in several cases of chlorosis and of gastric ulcer without success, but in the following case it proved of signal service:

A woman, aged 36, was admitted under the care of Dr. Latham, suffering from diarrhœa, with extremely offensive slimy stools, emaciation, irregular pyrexia, and prostration. She had the appearance of pernicious anæmia, but the examination of the blood excluded this—hæmoglobin, 10 per cent.; red corpuscles, 22 per cent. of normal. Her diarrhœa and anæmia persisted in spite of treatment by diet, bismuth, chalk, arsenic, iron, etc. She was then given β -naphthol (gr. iij) every four hours, and in a week the bowels acted but once a day, naturally, and the anæmia, pyrexia, and weakness gradually disappeared.

ON A NEW FORM OF PORCELAIN FILTER.

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FILTERING through porous earthenware is so constant a stage in the study of the metabolic products of the life of microbes, that I think the following description of a porcelain filter is worth recording. It includes nothing new in principle, but seeks to combine efficiency and cheapness to a greater degree than is the case with the filters in general use.¹

It consists of three essential parts: (A) a cylindrical vessel of porous biscuit ware closed at one end, which is rounded off so as to be able to resist pressure. The other end is open, and provided with a flange as shown in A, Fig. 1.; (B) a glass tube, the inside diameter of which is a trifle larger than the outside diameter of the earthenware pot, and which is about twice the length of the latter. Both ends are open, and one of them is provided with a flange, as shown in B, Fig. 1. This form of tube is used in ordinary gas analysis, and can readily be obtained from any chemical apparatus manufacturer; (C) a funnel made of non-porous earthenware. Its greatest inside diameter must be equal to that of the porous vessel, and it must be provided with a flange, as represented at C, Fig. 1. Fig. 2 indicates how these three pieces of apparatus are put together. B is the porous pot surrounded by the glass tube A; underneath is seen the funnel C; at D are shown the flanges separated from one another by a pair of india-rubber rings. Umbrella rings answer very well in the smaller form of the apparatus that I employ. By pressing the upper and lower flanges together

² Practitioner, July, 1890.

¹ The apparatus was shown at a meeting of the Physiological Society.

¹ Pflüger's Archiv, vol. xiii, p. 285.

by means of a clamp, a perfectly watertight joint is produced. The clamp is composed of two brass rings, connected together by three nuts and three screws, as shown in Fig. 3. To apply it the nuts are taken off the screws, and the two

FIG. 2.

rings separated. The upper ring is passed round the tube A, and rests on its flange. The lower ring is placed under the flange of the funnel. The three screws attached to the outer edge of one ring pass through holes placed in corresponding

FIG. 4.

positions in the other ring, and by putting on the nuts the two rings can be pressed together, and in this way the india-

rubber rings between the flanges can be subjected to a considerable pressure. Nothing more remains to be done but to attach the tubulure of the funnel C to an ordinary filtering bottle, as shown at E, Fig. 2, by means of an india-rubber cork. The liquid to be filtered is placed in A, and will pass through the porous wall of B into E when the latter is connected with the filter pump.

The advantages of this form of filter are: (1) Its cheapness, for since the porous vessel, the funnel, and the clamp are the only parts that require to be specially made,² and the other parts can be found in any laboratory or readily obtained, the whole can be put together for a few shillings. (2) Owing to the open form of joint used a leak between the india-rubber rings can be easily seen and at once remedied by tightening up the screws. (3) It is obvious from the shape of the filter that very nearly all the liquid to be filtered will pass through, and any solid matter present will settle to the bottom of the space between the inside of the tube A and the outside of the porous cylinder, instead of clogging the filtering surface, as would be the case if a flat slab of porous earthenware was used. (4) The filter can readily be taken to pieces and cleaned. When at length the porous pot becomes clogged it can be easily cleaned by scraping the surface with a file and sterilising in an autoclave or steam steriliser.

Although this filter will remove any germs present in the liquid to be filtered, it is difficult to prevent microbes from finding their way into the flask E from the surrounding atmosphere, especially as a quantity of air will be sucked back into it when the vacuum produced by the filter pump is removed. For some work this does not matter, as when the object of the filtering is merely to remove a pathogenic microbe and when the liquid filtered is immediately subjected to further treatment. In other cases, however, it is advisable to diminish this risk as far as possible, which can be done by using positive instead of negative pressure for the filtering. In this modification the filter is arranged as in Fig. 4. The glass cylinder containing the liquid to be filtered is closed at its upper end by an india-rubber bung N. This is provided with two holes, through one of which is passed a small funnel F, by means of which the liquid to be filtered is poured into the cylinder. The funnel can be closed by means of a thin glass rod L, whose lower end is thickened and covered by a piece of india-rubber tubing. By pulling this rod upwards so that the part covered with the tubing jams into the lower end of the funnel, a reliable stopper is formed, which can withstand any amount of inside pressure. The other hole in the bung is filled by a glass tube through which pressure is transmitted to the surface of the liquid. The different parts of the filter are kept together by means of a brass ring g, on which rests the flange of the funnel C and a brass plate p, which lies on the top of the india-rubber bung. The ring and the plate are pressed towards one another by three brass rods (of which two are drawn r r), provided with nuts, as shown in the illustration. Naturally two holes are cut in the brass plate corresponding to those in the india-rubber bung.

Pressure could be transmitted to the filter by any form of pump attached to the tube G; but I have found it more convenient to use the pressure from the ordinary water main for this purpose.³ A water tap T is connected with a tubulure bottle H by an india-rubber tube T M, which, in addition to being made of pressure tubing, must be further strengthened by a wrapping of tape. The other connections of the tubulure bottle are made by ordinary pressure tubing, and sufficiently clearly indicated by the diagram. On opening the tap T—which must be done cautiously—water enters the tubulure bottle and compresses the air contained in it. The pressure thus produced is transmitted by one tube to the filter, by another to the mercury manometer J. By means of a V tube the escape pipe K is inserted. It is closed by a screw clamp, which can be opened to allow the compressed air to pass out when the filtering is finished. It will be noticed that in the diagram the tube S connecting the manometer with the tubulure bottle is represented as passing to the bottom of

² These pots and funnels were made for me by Morlent Frères, 8, Rue Martel, Paris, in two sizes. The larger sized pots are 2½ inches in outside diameter, and 8½ inches high. The smaller are 1 inch by 6½ inches. They and the funnels cost between 1 and 2 francs each.

³ This very simple way of obtaining pressure was suggested to me by Professor Roy, who tells me that the safety-valve arrangement described below has been already employed by Ludwig.

the latter. By this means the manometer not only indicates the pressure but also acts as a safety-valve; for as soon as the mercury is forced down the shorter arm of the U tube to the bend at the bottom, the water coming from the tube S flows past the mercury column up the longer tube of the manometer J, and thus the pressure is relieved. Any tendency the mercury column may have to be carried bodily up the tube J by the advancing water can be decreased by inserting into J a thin glass thread. This decreases the stability of the mercury column and renders the passage of the water more easy. I ordinarily work with enough mercury in the manometer to form a column 300 millimètres high; consequently, on opening the tap the pressure slowly rises to this limit and stays constant. By adding to or removing the mercury the pressure can be increased or diminished at will. It is obvious that the two india-rubber corks in the tubulure bottle must be firmly wired in. When testing the apparatus it is advisable to first fill it with water by turning on the tap T while the funnel F is open; then, on closing the lower opening at F, the pressure will begin to rise.

I owe my best thanks to Professor Roy for many valuable suggestions relating to various practical details of this apparatus.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, ETC.

TAPPING THE VENTRICLES.

DR. LOWSON'S remarks upon the importance of drainage after tapping induce me to record a case.

A. H., a boy, aged 3 years, had hydrocephalus from the age of nine months, slowly increasing, but not interfering with intellectual development. The parents consulted me in May, 1890. I found the head markedly affected, with a circumference of 24 inches, and the anterior fontanelle enlarged and visibly pulsating.

I tried the derivative effect of mercurials with chloral and bromide for the sleeplessness and pain from which the child suffered and for a time with benefit; but he then became so much worse that I urged the parents to submit to tapping the ventricles.

On June 29th I passed a Southey's trocar through the anterior and outer corner of the anterior fontanelle, downwards and inwards deeply, the child having first been anaesthetised. On reaching the ventricle a jet of clear serous fluid spouted fully two feet from the cannula. Two ounces were withdrawn, and a collared cannula was then inserted, to which tapes could be attached. The dressing employed was a 1 in 2,000 solution of the biniodide of mercury on lint, covered with gutta-percha tissue, and occasionally changed by the mother of the patient.

The drain continued for a few days, but in about a week's time the cannula was forced out by the healing process. The bulging of the anterior fontanelle was replaced by marked depression, and the child recovered without a bad symptom.

Accrington.

C. R. ILLINGWORTH, M.D.

MYXŒDEMA IN THIBET.

A THIBETAN, suffering from myxœdema, died in Camp Gnatong, Sikkim, on November 17th, 1888. This man was taken prisoner after an engagement with the Thibetan army. The *post-mortem* appearances were as follows: Extremities much enlarged. A depression was easily made by pressure on the skin, disappearing at once when the pressure was removed. Over the chest this effect was extremely well marked. On dividing the skin a gelatinous substance was found, separating the former from the subjacent tissues. A considerable amount of serous fluid came from the wound. The thyroid gland was greatly enlarged, extending from the lower maxilla to about an inch under the sternum. The normal structure of the gland, as far as could be ascertained, was absent. Its place was taken by fibrous tissue. There was great congestion of the vessels of the neck and head, caused by pressure of the gland. Gelatinous tissue was found also on dividing the skin of

the neck; serous fluid came from the wound. The face was much swollen, especially about the eyes.

Another prisoner, presenting the appearance of myxœdema, was also seen. The thyroid gland could not be felt. A cystic tumour, about the size of a pigeon's egg, was situated near the normal position of the left lobe of the gland. This man was liberated and returned to Thibet.

Sixty-three Thibetan prisoners were examined by Surgeon I. K. Close, Indian Medical Service, and myself, as to the condition of the thyroid gland in each. The result of this examination is shown in the attached table.

Result of Examination of Sixty-three Thibetan Prisoners as to Condition of Thyroid Gland, on December 24th, 1888.

	Slightly Enlarged.	Moderately Enlarged.	Greatly Enlarged.	Total.
Right side	2	—	—	2
Left side	7	1	—	8
Both sides	9	3	3	15
Reduced in size both sides	—	—	—	2
Normal	—	—	—	36
				63

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Camp Gnatong, Sikkim.

PUERPERAL PNEUMONIA.

On Saturday, January 3rd, 1891, I received an urgent message to see Mrs. P., aged 29, who was in her seventh month of pregnancy, and was thought to be in labour. Since December 31st she had been feeling very ill, with a troublesome cough, repeated shivering fits, bad headache, and pain in the right side.

On arriving I found her sitting upright in bed, with a very drawn and anxious expression; her face was dusky and her extremities cold. She complained of acute stabbing pain in the right axilla, intensified on coughing and taking a deep breath; she had a short dry frequent cough, and no expectoration.

On examination I found a few scattered dry *râles* over the right base, behind and in the axilla; harsh breath sounds at seat of pain; normal vocal resonance and fremitus; slight impairment of note on percussion in right axilla; no rub; pulse small, compressible, 112; respirations shallow, 46; *alæ nasi* working; temperature in axilla 101.2°; tongue dry, covered with thick white fur; no motion of bowels for three days; no vaginal discharge and no abdominal pain. The uterus reached one inch above the umbilicus. I ordered milk diet; poultices to right side; calomel, grs. 4; and a mixture of vin. ipecac., spirit amm. co., spirit. etheris, syrup. toluatan.

January 4th. Orthopnoea very marked, patient leaning forwards on her knees; patch of dulness, tubular breathing, and fine crepitations in right axilla; pain in side very acute; temperature 102°; pulse small, weak, 140. Ordered brandy, 6 ounces.

From this time the patient went from bad to worse in every way. On the 5th the physical signs of pneumonia had spread all over the right base, up to the fourth rib behind. On the 6th she had a patch of dulness at the left base, and on the 7th the left base was dull up to the sixth rib behind, and covered with fine crepitations, while all over the right base bubbling *râles* had almost entirely replaced the fine crepitations. At this time there was profuse expectoration of muco-purulent blood-stained sputa. On the eighth I had increased the brandy to 24 ounces per diem, and the patient seemed to be dying, though quite intelligent and conscious. She had no abdominal pain till the 9th, when she was taken rather suddenly at about 10.30 p.m. with fairly strong bearing-down pains and slight discharge of blood and water. On the 10th, at 12.30 a.m., a dead child was born, the placenta following immediately, and there was very little hæmorrhage. Afterwards she seemed to rally for a little time, but soon got unconscious, and died at 5.30 a.m. on January 10th, the eleventh