pected confirmation of the opinion that the four pancreatic ferments are perfectly distinct bodies.

The most complete, active, and convenient medicinal equivalents of pancreatic juice are, however, the liquid extracts of the gland. These may be prepared from the pancreas of the pig, with glycerine, with water, or with brine. The glycerine extract leaves nothing to desire on the score of activity, and it keeps perfectly; but the taste of glycerine is to some persons objectionable, and it seems sometimes to provoke nausea, and even vomiting.

The aqueous extract, as prepared for me by Mr. Benger, will, I think, prove a valuable preparation. It is simply an extract of the gland in water, with just enough spirit added to keep it from decomposition. I propose to call it liquor pancreaticus. A sample of it is on the table before you. It is a limpid, straw-coloured fluid, with very little taste or smell of its own, and of nearly neutral reaction. But though so pale and bland, it is an elixir of really remarkable powers; it curdles milk like rennet; it changes starch into sugar with unrivalled energy; with the aid of a little alkali, it transforms albuminous substances into peptones; finally, it emulsifies fats more perfectly than any other known agent. Extracts of pancreas are destined, if I am not mistaken, to play a considerable part in the dietetic therapeutics of the future. Whether the full powers of these preparations can be made available when administered by the mouth, must be regarded as uncertain. As an aid to the digestion of starch, the propriety of giving them by the mouth cannot of course be doubted; but the propriety of giving them by the mouth as proteolytic agents is a less simple question, seeing that it requires the addition of an alkali to bring the trypsin into activity; and the addition of an alkali is an interference with gastric digestion which may, or may not, be advantageous in a particular case. I commenced to employ pancreatic extract by the mouth about two years ago, and have now had considerable experience of its use. Guided by theoretical considerations, I have usually directed the dose (a teaspoonful) to be given, with twelve or fifteen grains of bicarbonate of soda, one and a half or two hours after a meal, when gastric digestion might be supposed to be approaching its termination, and the later portions of the meal to be passing into the duodenum. There is at this late period of digestion a tendency to excess of acid in the stomach, and the alkali alone is undoubtedly of service; but I have had, in several instances, striking results from the combination of the extract with the alkali, which I had previously failed to obtain from the alkali alone. I am, therefore, pretty strongly convinced that, by administering a pancreatic preparation towards the tail of gastric digestion, you can, under the guardianship of a dose of alkali, convey it into the duodenum, where it arrives opportunely to aid in the important work of intestinal digestion. But, however useful pancreatic extracts may prove to be for administration by the mouth, I anticipate far more important results from their employment in the preparation of peptones and peptonised aliments; and to this subject I now beg to call your attention.

[To be continued.]

PORTSMOUTH.—The two most interesting features in Mr. George Turner's last report are the account of an epidemic of typhoid fever due to milk, and a critical study of infantile diarrhoea. Into the latter question we need not now go, as Mr. Turner's opinions have been already sufficiently explained in the JOURNAL (vol. i, 1879, page 821); but we may, in passing, pay a tribute of admiration to Mr. Turner for the earnest and laborious investigation which he is making into this very difficult question. The history of the milk epidemic is not very exactly told; but it may be broadly stated that, of 153 cases of typhoid fever, during the third quarter of 1878, in a town which stands worst as regards the disease of the twenty large towns, 64 per cent. obtained their milk directly or indirectly, from a particular farm. At this farm, there had been a case of typhoid fever, and the well of the house was within a few feet of the cesspit of the common privy. There seems, therefore, little reason to doubt that the milk supplied by this dairy contained the contagium of enteric fever, which was thus distributed to the consumers. During the year, the general death-rate was 19.02 per 1,000, which, though higher than that for 1877, is slightly below the average for the last six years. The increased mortality has been due rather to a general rise in the death-rate from all causes than from the presence of any large amount of zymotic disease. The greatest blot on the character of the borough is the high death-rate from typhoid fever. The reasons why Portsmouth seems to be so much subject to this disease are the flatness of the sewers, the insufficient ventilation of sewers and house-drains, and the defective construction of houses. The typhoid fever-rate in 1878 was 0.71 per 1,000, and the disease is always most prevalent at the end of the third and the beginning of the fourth quarter of the year. The figures for the other zymotic diseases call for no remark.

CLINICAL LECTURE

ON

AMPUTATION AT THE HIP-JOINT:

WITH CASES ILLUSTRATING THE USE OF THE LEVER
FOR CONTROLLING HÆMORRHAGE.

By RICHARD DAVY, M.B., F.R.C.S.,

Surgeon to the Westminster Hospital.

GENTLEMEN,—Some few years ago, I drew the attention of surgeons to the *per rectum* compression of the aorta and iliac arteries for the temporary arrest of hæmorrhage during the performance of operations, and practically demonstrated the efficacy of the method in cases of amputation at the hip-joint. I shall endeavour to interest you to-day, first, by practical observations on amputation at the hip-joint; and, second, by recording the ascertained experience of operating surgeons in the use of the lever for controlling bleeding during amputation at the hip-joint.

Firstly, in considering how surgeons may best restrain bleeding in amputation at the hip-joint, just look at a side view of the pelvis, with the arteries injected (Royal College of Surgeons' Museum, 939, Q. f. Homo); you will notice how that the anterior flap is principally fed by the external, the posterior by the internal iliac artery; therefore, the common iliac artery must be compressed to secure both. And Nature has so focussed her blood-courses at the common iliac artery for the nourishment of the lower limb, that it really seems strange that compression of this vessel should not have been earlier practised.

I would insist strongly on the absolute necessity for restraining loss of blood from the posterior flap; much as I respect the femoral artery in the anterior flap, yet more do I beg you not to underrate the large and numerous muscular branches of the gluteal and sciatic trunks in the posterior. In an interesting discussion at the Clinical Society of London, following a paper read by my colleague, Mr. A. Pearce Gould (*vide* BRITISH MEDICAL JOURNAL, May 10th, 1879), the use of the rectal lever was received with favour, and a comparison was drawn between it and digital compression. I can only state that, after a surgeon has proved practically how very easy it is to prolong indefinitely compression by the lever, he will not care to submit to the fatigue, uncertainty, and anxiety of the digital pressure. Nor can I see why the whole thickness of the abdomen should be squeezed, now that it has been shown that the common iliac artery may be compressed, with only the thin rectal wall intervening.

Mr. Newman of Glasgow has sent me a pamphlet, in which he describes a special knife and India-rubber bands for compressing the flaps during amputation at the hip-joint. It seems to me that, as Pancoast's tourniquet applied over the aorta is too high up, so also Mr. Newman's apparatus on the flaps is applied too low down; and that operating surgeons in future will act on the spirit of the motto,

"In medio tutissimus ibis",

and compress the common iliac artery *per rectum*.

I will just say one word on the perfect safety and absence of inconvenience in using the lever. I have personally compressed the common iliac artery in a man suffering from aneurism of the right external iliac artery, aged 60, for twenty minutes, and without chloroform or other anæsthetic. The only pain felt was the presence of a foreign body; showing how tolerant of pressure the upper part of the rectum is. In no case (so far as I am aware) has any blood or stain been seen in the stool, though I have watched carefully for this event.

On anatomical grounds, the situation of the common iliac artery is perfect for the ends of compression; the lever drops between the psoas magnus muscle and the bodies of the lumbar vertebræ, having the spring (sacral margin) of the true pelvic brim as a counter-resistance to the lever, and no large nervous trunks in the way. I tried to pass the lever once on a dead body at the Westminster Hospital, and failed; I dissected this rectum *in situ*, and found syphilitic stricture in it; in short, the gut was tied up like a boy's cracker; this is the only case in which any difficulty has been met with at present.

The lever is turned out of ebony, and varies in length from eighteen

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to twenty-two inches. Its surface is very smooth and polished; and its ends are rounded off much like the finger-tips. The maximum trans-

verse diameter is five-eighths of an inch; the minimum, three-eighths of an inch. The rectal end is graduated to an inch scale, so that the surgeon who applies the lever can at once learn whereabouts may be the end of the rod.*

I will end my first heading by enumerating what I maintain to be the salient advantages of rectal compression.

1. Most perfect control of the required artery.
2. Minimum amount of disturbance of the circulatory system.
3. Independence of the respiratory movements.
4. Its general and easy applicability; strictured rectum being the sole obstacle.
5. The pressure applied is so easy to maintain, and the assistant's body so well out of range of the operator that no hurry need perplex the one, nor anxiety the other.
6. Its application is quite safe in skilled hands, no injury having ever resulted, and but little pain having been suffered.
7. Cheapness and simplicity; illustrating a lever of the first order.
8. The success hitherto achieved by its employment.

Let us now consider the already ascertained experience of operating surgeons on the use of the lever in controlling bleeding during amputation at the hip-joint.

I have the record of ten cases in which the lever has been used: the total amount of blood lost during the ten operations has been under eighteen ounces, and there have been 80 per cent. of recoveries.

Here is a table, drawn up under my own observation, which summarises this new experience; the cases have occurred in the practice of Mr. Gould, Mr. Armstrong, Mr. Young, Mr. B. Wills Richardson, Mr. Cadge, Mr. George Cowell, Mr. Macnamara, Mr. Stokes, and myself.

Table of Cases of Amputation at the Hip-Joint.

No.	Sex.	Age.	Admission.	Year.	Surgeon.	Nature of Disease.	Operation.	Departure.	Result.	Ounces of Blood lost.
1	Boy	9	July 10th	1875	Mr. Davy	Morbus coxæ. R.	January 16th, 1877	May 16th	Recovery	1½
2	Man	28	October 25th	1878	Mr. Bond	Morbus coxæ. R.	December 7th, 1878	December 11th	Death from thrombosis	3
3	Boy	12	February 2nd	1878	Mr. Gould	Excision previously				
					Mr. Davy	Morbus coxæ. R.	January 22nd, 1879	January 31st	Death from exhaustion; albuminuria	2½
					Mr. Armstrong	Excision previously, Dec. 17th, 1878				
4	Boy	9	January 12th	1879	Mr. Davy	Morbus coxæ. R.	February 4th, 1879	May 29th	Recovery	1½
					Mr. Young					
					Mr. H. Marsh					
5	Girl	8	February 14th	1879	Mr. B. Wills Richardson (Dublin)	Morbus coxæ. L. Necrosis, acetabular and femoral	March 1st, 1879	June 10th	Recovery	2½
6	Man	21	April 12th	1879	Mr. Cadge (Norwich)	Osteo-sarcoma. R. Fracture of lower third femur	April 4th, 1879	June 9th	Recovery	2
7	Boy	7	November 29th	1878	Mr. Cowell	Morbus coxæ. R.	June 17th, 1879	September 3rd	Recovery	¾
8	Boy	5	August 14th	1878	Mr. Davy	Morbus coxæ. R. Excision previously	July 16th, 1879	In hospital	Recovery	1
9	Boy	6	May 7th	1879	Mr. Macnamara	Morbus coxæ. R.	August 8th, 1879	Eastbourne	Recovery	1
					Mr. Davy					
10	Man	43	August 29th	1879	Mr. Stokes (Dublin)	Caries. Left	October 1st, 1879	In Richmond Surgical Hospital	Recovery	1
									Total.....	16¾

CASE 1.—This has been duly reported in the BRITISH MEDICAL JOURNAL, May 18th, 1878, page 704.

CASE 2.—Mr. A. Pearce Gould. This case is reported in the BRITISH MEDICAL JOURNAL, May 10th, 1879, page 704; and will appear in the Transactions of the Clinical Society.

CASE 3.—Mr. Armstrong, Surgeon to the Royal Hospital School, Greenwich, intends to publish his case in detail. (See next page.)

CASE 4.—Mr. Young of Sevenoaks also intends publishing his case in full.

CASE 5.—Mr. B. Wills Richardson has reported his case in the Medical Press and Circular, April 9th, 1879.

CASE 6.—Mr. Cadge of Norwich wrote to me on June 9th, 1879, as follows: "I can scarcely think that any other plan than your lever will be used in future; I can see no drawback to its use, and the facility of its adaptability is equal to the certainty of its action, and in both these respects nothing better can be desired." Mr. Cadge's patient died on June 15th, 1879, of pulmonary sarcomatous deposits; but the stump had healed, with the exception of two sinuses.

CASE 7.—Mr. George Cowell. This boy lost the smallest amount of blood ever recorded in an amputation of the hip; and the patient has made a rapid recovery.

CASE 8.—This boy had lardaceous disease of his viscera, with dis-

trressing ascites. It would have been impossible to compress his aorta or his common iliac artery through the abdominal wall, by reason of the distension. This boy's recovery is pleasing, and the albumen in his urine is daily diminishing.

CASE 9.—Mr. Macnamara. This boy made a splendid recovery; and was sent to Eastbourne one month after the operation.

CASE 10.—Mr. Stokes of Dublin intends to publish his case *in extenso*.

August 22nd, 1879. I have this day received a note from Mr. W. Whitehead of Manchester, who states that he has used the lever with perfect success, and has forwarded his report thereon to the JOURNAL. (See page 693.)

It is worthy of remark that, out of these ten cases, nine are males, and eight occur in the right hip.

I was informed that Mr. Barwell had used the lever at Charing Cross Hospital; his House-Surgeon, Mr. Pattison, has furnished me with the following facts.

On May 8th, 1879, amputation at the left hip-joint was performed by Mr. Barwell at the Charing Cross Hospital.

"Boy, aged 7, the subject of morbus coxæ and previously excised left hip-joint. "Mr. Davy's lever was used, and was held by Mr. Cantlie. The child lost a quantity of blood during the operation; this being seemingly due to the fact that the lever compressed the common iliac vein as well as the artery, the blood lost being principally venous. After the operation, the boy recovered consciousness; but in about four hours' time was seized with a convulsion and died."

My only remark on this case is, that it must be impossible for the branches of the common iliac vein to bleed had the common iliac artery been effectually compressed.

In order that I might verify the hæmostatic value of the lever in amputations at the hip-joint, I performed the following experi-

ments on the dead body. Having opened the aortic sheath, I inserted into the aorta a large pipe about one inch and a half above the bifurcation into the two common iliac arteries; and connected this pipe with a water-syringe, compressed by the hand of our Surgical Registrar, Mr. Forsbrook. I next amputated the right thigh at the hip-joint, and the water ran out freely in a *per saltum* spring. I then inserted the lever *per rectum*, compressed the right common iliac artery (Mr. Forsbrook still continuing his pumping), and immediately the flow of water ceased at all the cut ends of the vessels, and remained so as long as the compression was maintained. The longest time that I remember in which the lever was acting is twenty minutes—more than sufficient time for a careful operator to complete the details of a hip-joint amputation.

The lever that was used for the first time on the living body, and which was applied on the common iliac artery by my colleague Mr. Thomas Bond, has been presented to the Museum (Surgical Instrument Department) of the Royal College of Surgeons, London.

In conclusion, I commend this simple method of restraining hæmorrhage to the notice of operating surgeons as safe, reliable, and effectual; its future is by no means limited to amputations at the hip, but is applicable to all surgical procedure where it is desirable to check *pro tempore* the blood-current through the aorta or iliac arteries; and I trust that the wide field of practical surgery may yield instances of its varied utility.

* The instrument is manufactured by Messrs. Wright and Co., of 108, New Bond Street, W.