

lightly stained and the fourth coccus stained deeply. Examples of both the lightest and deepest stained cocci were, as a rule, found amongst the larger forms. The component cocci of a single diplococcus were not infrequently unequal in size.

The cerebro-spinal fluid itself was kept for 48 hours without any noticeable increase in the number of diplococci. It was then incubated for 24 hours at 39°C. and proved an excellent pabulum for the organism which grew luxuriantly in it. This is, I think, of some importance, apart from its interest, as cases may occur where suitable culture media are not obtainable. Of the tubes inoculated from the nasal cavity, mixed growths developed both on the agar-agar and on the blood serum. No growth of the specific organism could be found upon the agar-agar, but on the Löffler's blood serum colonies of the diplococci were obtained. No growths of the diplococcus were discovered in the cultures made from the pharynx. The urine immediately after being voided was centrifuged; the deposit was washed in distilled water, re-centrifuged, and examined; but though numerous micro-organisms, including diplococci, were found none were detected exhibiting the characteristics of Weichselbaum's diplococcus. The cerebro-spinal fluid was tested as to the presence of iodide of potassium but was found to contain none; ten grains of it had been taken when the lumbar puncture was made.

As to how this case occurred I can offer no explanation. The presence of the organism in the nasal chamber would point to an aerial infection. There was no history of letters, books, clothes, animals, or friends coming from a distance, nor had the child been away from Cheltenham.

I would like to express here my obligations to Dr. Kirkland, not only for his help and interest in the management of the case but also for his kindly assistance in preparing this account of it.

July 1st.—The patient has continued to make an uninterrupted recovery and is now perfectly well.

Cheltenham.

A CASE OF PERFORATED GASTRIC ULCER WITH FATAL HÆMORRHAGE FROM THE BOWEL IN AN INFANT 45 HOURS OLD.

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I WAS hastily summoned one evening to see an infant who was said to be bleeding profusely from the bowel. The mother had been delivered at 4 A.M. the previous day by a midwife who stated that the confinement was in every way normal, the entire duration of the labour (the ninth) not exceeding three hours. When I saw the infant, a boy, he was lying in a semi-collapsed state. The mother's story was that in the evening the child had refused the breast altogether, although he had previously taken it quite readily. When she proceeded to change the infant's napkin, about 7 o'clock, she found that it was saturated with blood of a slightly dark colour and while she was preparing a fresh napkin two great gushes of blood spurted out from the child. On removing this second napkin I found it soaking with blood and a little still continued to ooze away from the anus. The bowels had previously been moved naturally, the colour of the stools being that of meconium. There was no sign of prolapse. The umbilical cord had not been tied until pulsation had ceased; it was properly secured and looked perfectly healthy. There was no history of hæmophilia, syphilis, or phthisis, and the child was not jaundiced. The heart-beats were regular; there was no bleeding from the mucous membranes and nothing to suggest that the child had swallowed blood—e.g., from fissured nipples, or during the act of birth. On examining with the finger in the rectum and bimanually nothing abnormal could be detected; the finger on withdrawal was covered with blood of a fresh colour. The abdomen was most carefully palpated without revealing anything unusual; no tenderness, localised or general, seemed to be present. Invagination of part of the bowel was thought of as a possible cause of the hæmorrhage, but the great quantity of blood lost, its non-admixture with mucus and

slimy matter, together with the absence of blood-stained motions and of any indication of tenesmus seemed to negative that view; nor were there any physical signs to support it. Gastric or duodenal ulcer appeared to be excluded by the entire absence of vomiting and by the comparatively fresh colour of the blood lost. A provisional diagnosis was made of some form of ulcer pretty low down in the intestine as being the likeliest cause of the hæmorrhage, and, acting on this theory, a rectal injection of equal parts of adrenalin and hamamelis was given, the grave condition of the child precluding any possible surgical measures being resorted to. A small plug of cotton-wool was inserted temporarily in the rectum to retain the injection. The infant was then placed in bed with the legs raised and the head lowered. A very bad prognosis was given, having regard to the large amount of blood lost, and this was amply justified by the infant's death three hours later, being six hours after the bleeding was first noticed and 45 hours after birth.

Necropsy.—Post-mortem examination was restricted to the contents of the abdomen. On opening into the abdomen no blood was found in the peritoneal cavity. The entire length of the intestine was examined for intussusception but none existed. The whole alimentary tract was then removed in one piece from above the cardiac opening of the stomach to the lower rectum and was slit open along its entire length when it was seen to be filled with blood, mostly in a semi-fluid condition. No indication of ulceration was found until the stomach was reached. This organ contained a large amount of semi-fluid blood and mucus mixed with partially digested milk. On carefully washing away this detritus a typical gastric ulcer of the acute form was exposed, with perfectly clean-cut, punched-out margins, situated on the posterior wall of the viscus near the lesser curvature and about half an inch from the cardiac opening. The ulcer was completely perforated and, as some shreds of mucoid material were found adhering to its peritoneal aspect, the posterior abdominal wall was again examined and a little of this blood-stained mucoid matter was seen lying in the situation which the ulcer must most probably have occupied, evidently indicating that adhesion of the ulcer had actually taken place at this point but had become separated during the removal of the stomach from the abdomen and had been the means of preventing the escape of the blood into the peritoneal cavity. The ulcer was circular in form and was almost of the size of a threepenny-piece on its inner surface. Running up to the ulcer a blood-vessel could be traced with some difficulty, probably a large branch of the left superior coronary artery of the stomach and the one whose rupture had set up the hæmorrhage. The mucous lining of the stomach for a radius of three-quarters of an inch from the circumference of the ulcer was markedly congested and formed a notable contrast with the remainder of the mucosa which was distinctly paler in colour. There was a slight thickening all round the edges of the ulcer and its immediate vicinity. The other abdominal organs were normal.

Gastric ulcer is very rare before puberty, yet it has occasionally been observed soon after birth and also in the newly born. In most cases it has been the simple ulcer but tuberculous and syphilitic ulcers have been described in this connexion. The extreme rarity of the condition in the very young has been attested by various writers. Thus Fenwick¹ refers to 18 collected cases of genuine examples of ulcer of the stomach in infancy or childhood, 13 of which were of the acute type and five of the chronic variety, the ratio of females to males being 4 to 1. Welch,² quoted by Fenwick, found out of 607 cases only one case occurring in the first decade of life, and Rokitanski³ had not met with a single case under 14 years of age in his extensive experience. Goodhart⁴ records a case in which death took place 30 hours after birth and in which the ruptured vessel could be seen with a lens lying open in the floor of the ulcer. Ulceration of the stomach at birth has also been described by Rilliet, Billard, Hænoch, Dreschfeld, Düsser, and others. Recently Morris and Feldman⁵ have published a case of hæmatemesis and melæna in an infant two days old, due undoubtedly to gastric ulcer, in which recovery took place. a termination met with, according to Eichhorst, in less

¹ Fenwick: Ulcer of the Stomach and Duodenum, 1900.

² Ibid.

³ Ibid.

⁴ Goodhart: Transactions of the Pathological Society of London, 1881, vol. xxxii.

⁵ Morris and Feldman: Brit. Med. Jour., Feb. 18th, 1905.

than 50 per cent. of such cases. Actual perforation of the ulcer, as in our own case, is extremely rare. A puzzling feature of this case was the entire absence of vomiting. Considering the ease with which infants reject the contents of the stomach it certainly seems strange that all the blood should have been passed per rectum. In most cases of gastric ulcer blood accumulating in the stomach acts as a foreign body and excites nausea, followed by vomiting in a very short time. In other cases, again, the irritation of blood lying in the stomach would seem to stimulate intestinal movements to get rid of it by the bowels. Still, it must be very rare that vomiting is entirely absent and that all the blood is voided per rectum. Such a condition would almost suggest *a priori* a mode of distinguishing between duodenal and gastric ulcer but this case seems to show that such a distinction cannot be depended on. What determined the actual onset of bleeding in the case is an interesting speculation. Most probably it was due to the milk imbibed setting up vigorous gastric peristalsis, which, with the concomitant increased vascularity of the organ consequent upon the act of digestion, would be sufficient to bring about the final rupture of the already partially eroded vessel or to dislodge any clots which may have sealed over the opening of the vessel at the point of erosion.

Wigan.

RATES OF ATTACK BY ENTERIC FEVER
IN 90 LARGE TOWNS OF ENGLAND
AND WALES.

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A GENERAL indication of the relative degree of prevalence of enteric fever in different towns, or groups of towns, in England and Wales can readily be obtained by reference to the mortality returns published by the Registrar-General. Often, however, it would be more useful to be able to contrast the relative number of notified cases of this disease than to be guided by the relative number of deaths. In an addendum to a report to the Local Government Board on the sanitary circumstances of Sheerness, lately published, I have recorded a considerable series of attack rates by enteric fever which were calculated for this purpose and are likely to be of sufficient general utility to warrant their reproduction.

In the table below are given the annual attack rates by enteric fever in 90 large towns of England and Wales during the years 1898 to 1904 inclusive. The middle year 1901 is the census year and the rates have in each instance been reckoned on the 1901 census population, a proceeding sufficiently exact for the purpose required. The figures have been extracted and tabulated in the medical department of the Local Government Board by Mr. W. Hunter. My colleague Dr. Theodore Thomson, in a report on enteric fever in Swinton and Pendlebury (Annual Report of the Medical Officer of the Local Government for 1898-99, p. 168) gave the annual attack rates by enteric fever of 50 towns for which the necessary data were then available. These figures were quoted at the time in THE LANCET.¹ For convenience of comparison I have marked these 50 towns with an asterisk in the table below. The annual attack rate by enteric fever for the whole of these 50 towns during the period with which Dr. Thomson dealt, 1893-97, was 1·03.

The table below gives the annual attack rates by enteric fever from 1898 to 1904, inclusive, of: (a) the 75 towns of England and Wales which had a population at the 1901 census exceeding 50,000. In the case of 35 of these 75 towns the corresponding attack rates for the period 1893-97 were given by Dr. Thomson in the report referred to. (b) 15 towns of England and Wales with a population at the last census less than 50,000, in respect of which Dr. Thomson gave the corresponding attack rates for the period 1893-97. The total number of towns dealt with in the table is thus 90. The data enable calculation of the following annual attack rates by enteric fever during 1898-1904: all the 90 towns, 0·96 per 1000; all the 75 towns of England and Wales

whose population at the 1901 census exceeded 50,000, 0·97 per 1000; all the 50 towns whose attack rates for 1893 to 1897 were given by Dr. Thomson, 0·89 per 1000.

Towns.	Popula- tion (census), 1901.	Annual attack rates per 1000 by enteric fever during the seven years 1898-1904.	Towns.	Popula- tion (census), 1901.	Annual attack rates per 1000 by enteric fever during the seven years 1898-1904.
90 urban dis- tricts	15,170,479	0·96	*St. Helens [99]	84,410	1·47
75 urban dis- tricts with popu- lations over 50,000	14,506,863	0·97	Rochdale [98] ...	83,114	0·45
*50 urban dis- tricts	10,411,007	0·89	*Stockport [98]	78,897	0·81
			York [00]	77,914	1·55
			*Aston Manor...	77,326	1·56
			Reading	72,217	0·35
			*Hornsey	72,056	0·37
			*Devonport ...	70,437	0·56
*London	4,536,541	0·71	*Coventry [99] {	69,978	0·95
*Liverpool	684,958	1·19	[01]		
Manchester	543,872	0·81	*Merthyr Tydfil {	69,228	2·34
*Birmingham ...	522,204	1·12	[03]		
*Leeds	428,968	1·01	*Newport (Mon.)	67,270	0·69
*Sheffield [99] ...	380,793	1·73	Ipswich [99] ...	66,630	1·65
*Bristol	328,945	0·65	Hastings [99] ...	65,528	0·32
*Bradford	279,767	0·93	*West Brom- {	65,175	0·93
West Ham	267,358	1·54	wich [00] ... }		
*Kingston - on - {			Warrington [00]	64,242	0·78
Hull	240,259	0·89	*Grimsby	63,138	4·06
Nottingham	239,743	1·75	*West Hartle- {	62,627	0·38
*Salford	220,957	1·27	pool		
Newcastle - {			Hanley [99] ...	61,599	1·19
upon-Tyne [98] }	215,328	0·50	Wigan [99] ...	60,764	1·48
Leicester [98] ...	211,579	0·61	Bootle [98] ...	58,556	1·30
Portsmouth [00]	188,133	2·38	Bury	58,029	0·70
Bolton	168,215	1·30	*Barrow-in- {	57,586	1·09
*Cardiff	164,333	0·50	Furness ... }		
Sunderland [98]	146,077	1·73	King's Norton {	57,122	0·51
Oldham	137,246	0·48	and Northfield }		
Croydon	133,895	0·37	*Smethwick ...	54,539	0·91
Blackburn	127,626	1·24	Rotherham ...	54,349	1·28
Brighton [99] ...	123,478	0·65	Wallasey [01] ...	53,579	2·10
Willesden	114,811	0·54	Handsworth {	52,921	0·55
Rhondda	113,735	2·56	(Staffs)		
Preston	112,989	1·48	Stockton-on- {	51,478	1·26
Norwich [98] ...	111,733	1·24	Tees		
Birkenhead	110,915	1·76	*Tynemouth ...	51,366	0·45
Gateshead [98] ...	109,888	0·51	Great Yarmouth {	51,316	2·00
*Plymouth [00]	107,636	0·62	[98]		
Derby	105,912	1·00	*Burton-on- {	50,386	0·54
Halifax	104,936	0·66	Trent [01] ... }		
*Southampton...	104,824	1·20	*Bath	49,839	0·29
*Tottenham ...	102,541	0·93	*Oxford [98] [00]	49,336	0·25
*Leyton	98,912	0·89	*Southport ...	48,083	0·70
*South Shields	97,263	1·06	*Gloucester ...	47,955	0·17
Burnley	97,043	0·82	*Exeter [99] ...	47,185	1·51
East Ham	96,018	1·14	*Bournemouth	47,003	0·22
*Walthamstow...	95,131	0·90	*Worcester ...	46,624	0·37
Huddersfield ...	95,047	0·62	*Carlisle	45,480	0·32
Swansea	94,537	0·86	*Darlington ...	44,511	1·20
*Wolverhampton	94,187	1·29	*Eastbourne ...	43,344	0·35
*Middlesbrough {			*Dover	41,794	0·31
[98]	91,302	1·40	*Barnsley	41,086	2·36
*Northampton...	87,021	0·56	*Cambridge [98]	38,379	0·71
*Walsall	86,430	0·83	*Colchester ...	38,373	0·51
			*Macclesfield {	34,624	0·95
			[00]		

* Fifty urban districts for which attack-rates by enteric fever in 1893-97 were recorded by Dr. Thomson in the annual report of the Board's medical officer for 1898-99, p. 168.
[97], [98], &c. In the year indicated the number of enteric fever cases notified exceeded one quarter of the total number of enteric fever cases notified during the seven years 1898-1904.

¹ THE LANCET, Feb. 25th, 1899, p. 542.