tion there protoplasm is used up and exhausted, only a small remnant persisting to mark the cell body. Finally, as instructive analogies may be pointed out the epithelial cells of the Malpighian layer of the epidermis which presents fibrils passing through the cell bodies and constituting the intercellular "bridges" (Ranvier), comparable to the fibres passing through the cell bodies in the stellate neuroglia fibre cells; for were the epithelial cell-bodies further apart, and the fibrils relatively longer, their appearance would be not unlike that of the stellate neuroglia fibre cells, an analogy which strengthens the relationship (by genesis) of the neuroglia fibre cells to epithelial elements.

The protoplasmic glia elements are really the elements which exhibit a morbid hypertrophy in pathological conditions (alcoholism, G.P.), and which may show further morbid activities, in the last stage of which their protoplasm will deposit numerous organised fibrillæ, in the act of doing which the protoplasm proper is used up, except a scanty remnant, which may persist, ghost-like, to mark the position of what was once a protoplasmic cell body.

Thus in fundamental facts of structure, in their topographical distribution, in ontogenesis, in their relationships to vascular and lymphatic systems, and in the morbid changes they show it would seem that there are ample grounds for supporting the classification of the neuroglia elements into protoplasmic cells and fibre cells. The growing importance of these elements is becoming daily obvious, especially in brain pathology.

CONGENITAL (?) DILATATION AND HYPERTROPHY OF THE COLON FATAL AT THE AGE OF 11 YEARS.

By T. J. WALKER, M.D.,

Surgeon to the Peterborough Infirmary.

WITH PATHOLOGICAL REPORT

By JOSEPH GRIFFITHS, M.D.,

Pathologist at Addenbrooke's Hospital, Cambridge.

THE boy (F. S.), aged 11, the subject of this note, died on February 6th, 1890. At birth nothing unusual was noticed about the child, but within a few weeks the abdomen was observed to be unusually large, this enlargement increasing to such a degree that when 3 months old the child was taken to the Peterborough Infirmary for treatment. Nothing was then detected beyond considerable flatulent distension. The bowels acted regularly, and the child took nourishment freely, and did not apparently suffer special discomfort from the distension. Carminatives were administered, and strict directions as to diet given, but the condition remained unchanged, and the child ceased to attend.

About three years after the boy was again brought to the infirmary; the distension by this time had enormously increased, but again careful examination detected nothing more than a general tympanites, and the boy did not continue to attend. From this time until his death he was only occasionally under medical care. I used frequently to see him playing quietly or walking in the streets, but had nothing to

do with him medically. On February 6th I was told of his death.

On inquiry I learned from the mother that from the time I saw him at the hospital eight years before, his body had gradually enlarged, that he suffered very little pain; his bowels were always confined, but could be relieved by enemata, or by passing a piece of soap into the rectum; his appetite was always bad, his breathing short, his muscular development feeble, his health generally varying with the degree of distension of the abdomen—that occasionally wind would "roar away" from the anus, the body becoming greatly reduced. Latterly the boy had suffered more pain, and had wasted considerably, but he had not been in any way alarmingly worse, and had died suddenly whilst an enema was being administered.

A *post-mortem* examination was made by Dr. Kirkwood and Dr. A. Platt, and the rough sketch of the corpse is drawn to scale from their measurements.

The height of the boy was a little over 4 feet; the total length over the abdomen, taken with a tape from the suprasternal notch to the pubes was 2 feet $3\frac{1}{2}$ inches. This being thus divided:

	Ft.	In.
Suprasternal notch to base of ensiform ...	...	0 4 $\frac{1}{2}$
Base of ensiform to umbilicus ...	...	0 13
Umbilicus to pubes ...	...	0 10
Girth just above nipples ...	...	0 27
Girth at point of greatest distension, 4 inches above umbilicus ...	...	3 11
Antero-posterior diameter at level of umbilicus ...	...	0 13

The diagram does not show, of course, the enormous width of the abdomen, which was very striking.

The body was emaciated, the lower part of the thorax greatly expanded and thrown upwards. On opening the abdomen, nothing was seen but an enormous coil of intestine, looking like a large leg and thigh, with the knee completely flexed; this, on further examination, was seen to be the transverse and descending colon, which measured 23 inches round; tracing it down it was seen that the excessive dilatation reached to the sigmoid flexure, gradually diminishing in this section of the bowel, the last part of which and the rectum were normal; there was no appearance of the slightest constriction, either in the rectum or the sigmoid flexure; in the lowest part of the colon was a considerable mass of soft faeces, which was readily squeezed into the rectum and out of the anus: tracing the distended bowel upwards it was found to diminish somewhat as it approached the cæcum, and the whole of the small intestine was normal in every respect. The ascending and descending colon had both a distinct mesentery. There were no adhesions or other ordinary signs of peritonitis, but the peritoneum was extraordinarily thick.

The distension of the abdomen had spread out and thrown up the lower part of the thorax, so that the thoracic cavity was described by Dr. Kirkwood as resembling a shallow pie dish; the back of the diaphragm being fixed the anterior edge was tilted up, so that the under surface of the liver looked directly forwards; the depth from the suprasternal notch to the top of the diaphragm was about $2\frac{1}{2}$ inches, the lungs and heart being crowded into a space altogether inadequate for their normal development and action. The condition of the mesenteric glands, as seen in the specimen, is sufficient to account for the emaciation and increasing feebleness described by the mother of the boy. The immediate

[Drawn from measurements taken after death.]

cause of death was concluded to be the embarrassment of the enfeebled heart's action by the distension of the abdomen. The only way in which I can imagine defæcation carried on by a bowel enlarged to the enormous size of this boy's colon would be by the gradual accumulation in the colon of soft fæces, until the mass attained a sufficient size to be grasped by the bowel, which would then, by peristaltic contraction, carry it on to the funnel-shaped sigmoid flexure, where it would lodge, dropping like a ball valve in the narrower portion, causing the periodic attacks of pain and increased distension; the enema or soap suppository, stimulating the bowel to increased contraction, would cause the mass to be moulded and squeezed on into the rectum, and this being expelled, a period of relief would follow. Dr. Griffiths reports on the pathological condition of the affected parts as follows:—

PATHOLOGICAL REPORT BY DR. GRIFFITHS.

The cæcum, portion of colon, and the rectum sent to me by Dr. Walker are very uncommon, if not unique, and the following is a brief description of each portion.

1. The cæcum is large and much distended, the walls being thick and more muscular than natural. The small intestine attached to it is also large and thick walled, and the vermiform appendix is 5 inches long and nearly twice as thick as it usually is in a lad of the same age. The ascending colon, of which about 1 inch is still attached, is comparatively small, though its walls are thick and muscular.

2. The transverse colon, of which there is a complete portion of an inch or so in length, measures 16 inches in circumference, the sacculi are quite obliterated, the colon being in this place a cylindrical tube; the three muscular fasciculi, which are so prominent in the natural and undistended colon, cannot be distinguished on the exterior, though they can be traced as very attenuated bands of muscular fibres in a section of the wall. The exterior of the colon is covered by somewhat thickened peritoneum, and its muscular wall, chiefly the circular coat, is much thickened, and the mucous membrane finely granular and fixed to the subjacent muscular coat. Under the microscope the mucous membrane of this distended and enlarged part of the colon is much thickened from the effects of chronic inflammation, the free surface being almost denuded of epithelium, and the glandular crypts having in great part disappeared. The epithelium that may still be seen here and there on the surface is less columnar than the natural variety found here, there being hardly any mucin-forming cells to be seen. The loose areolar tissue existing in the natural state between the mucous membrane and the muscular coat had completely disappeared, and what now represents the mucous membrane is firmly adherent by fibrous connective tissue to the inner surface of the muscular wall. The circular coat, which is at least $\frac{1}{8}$ inch in thickness, even in this extreme state of distension of the bowel, is composed entirely of non-striped muscular fibres, most of which are of large size, and many of which are of new formation. The external longitudinal coat, which is, in the normal colon, disposed in three narrow bands, is in this instance almost continuous round the bowel, for each of the bands had become flattened out so as to almost touch its neighbours, each band present-

Section of mucous membrane of transverse colon showing great thickening of the mucosa from infiltration with small round cells, loss of Lieberkühn's glands and the desquamation of the epithelium from the surface. (a) thickened muscularis mucosæ passing on the left into an enlarged and infiltrated lymph follicle, where it spreads out and is lost. ($\times 45$.)

ing in shape, in a transverse section of the gut, a finely attenuated crescent. The muscle fibres in this coat also are of large size, and many are newly formed. Thus both muscular coats are in a state of hypertrophy, but the mucous membrane is in that state that characterises chronic inflammation.

3. The rectum is somewhat large for a lad of 11 years, and its muscular walls are thicker than natural.

The colon thus distended had been the seat, for some time at least, of chronic inflammation of its mucous lining and hypertrophy of both circular and longitudinal muscle coats.

In the absence of any obstructing agent in the shape of stricture or growth of any kind, it appears to me that this, so far as I know, unique condition, resulted in the first instance from inflammation of the mucous membrane of the colon—colitis, as it is called—which, from some cause or other, became chronic. Great distension followed from the altered chemical changes in the fæces, much gas being produced. Such distension of the gut would naturally render peristalsis more difficult. The increased difficulty in driving the fæces onward was compensated for by an increase in the size of the individual muscle fibres, and also by the formation of new fibres—a true hypertrophy.

ABSTRACT OF LECTURES

ON

THE SURGERY OF THE AIR PASSAGES AND THORAX IN CHILDREN.

Delivered at the Royal College of Surgeons of England.

By BERNARD PITTS, M.A., M.C.CAMB., F.R.C.S.,

Assistant Surgeon to St. Thomas's Hospital, and Surgeon to the Hospital for Sick Children, Great Ormond Street.

LECTURE III.

ENLARGED MEDIASTINAL GLANDS.

ENLARGED and especially caseating mediastinal glands occasionally give rise to serious trouble. 1. By pressing on the trachea or bronchus. 2. By one or more glands ulcerating into the trachea or bronchus, and causing obstruction, or even becoming detached and getting impacted in the larynx. 3. A suppurating mediastinal gland not infrequently is the cause of a gangrenous abscess of lung. Sometimes a communication is made with the œsophagus, or the suppuration from the gland discharges into the pleural sac. Fatal hæmorrhage may arise from the ulceration, involving a branch of the pulmonary artery. If there be good reason to believe that the difficulty of breathing in any case depends upon pressure from a mediastinal abscess, careful exploration of the bronchi must be attempted. Possibly, too, the introduction of a curette might be indicated, if abscess or gland matter was found in trachea or bronchus. Excluding the presence of a foreign body, suppuration of a mediastinal gland opening into a bronchus is certainly the most frequent cause of a gangrenous abscess of lung in children.

TRAUMATIC PNEUMOTHORAX.

Laceration of the lung may occur in children from a crush of the chest without fracture of the ribs, the rupture of lung tissue being probably due to its compression between the contusing force transmitted through the elastic ribs, and the air imprisoned by spasmodic closure of the glottis at the time of the accident.¹ The prognosis is hopeful in children even in severe cases of injury to the thorax.

The reports of 12 cases in the records of St. Thomas's Hospital had been analysed. In all the injury was produced by being run over by a cart. Four terminated fatally. One or more ribs were ascertained to be broken in 8 of the number, whilst in 4 the ribs were believed to be intact, including 3 fatal cases in which this was made certain by examination after death. Emphysema was present in 5; in 2 of the number the emphysema was limited to the neck, and probably the air made its way there from the mediastinum, since the ribs were intact. Spitting of blood occurred in 7, fluid in the pleural cavity in 7, and this fluid was found to be blood in the 4 fatal cases. Pneumothorax was an immediate symptom after the accident in 6 cases, and was noticed within the next forty-eight hours in the remainder of the St. Thomas's cases.

¹ Holmes on *Surgical Diseases of Children*.