

small, to be overlooked even in the course of a "cold" laparotomy. In the presence of inflammation it would be still easier for the offending organ to be missed. The fact that the patient made an uneventful recovery does not, of course, rule out the diagnosis of appendicitis. If the appendix was truly absent then it would be tempting to suggest the presence of an occult and inflamed caecal diverticulum to explain the typhlitis.

Congenital Fibrosis of the Pancreas

Q.—What is the aetiology of congenital fibrosis of the pancreas? I have a patient who has had two children, in 1940 and 1949, with normal pregnancies and deliveries, who both died of fibrosis of the pancreas at about 6 months. The patient has just become pregnant for the third time. What are the chances of this child being affected, and are there any prophylactic measures which may be taken?

A.—Congenital fibrosis of the pancreas is not particularly uncommon. It was first described in this country by Clarke and Hadfield in 1924 (*Quart. J. Med.*, 1924, 17, 358), but it was not until the publication in 1938 of a series of cases by Andersen (*Amer. J. Dis. Child.*, 1938, 56, 344) that the condition aroused the interest of paediatricians.

The disease is invariably fatal between the ages of 2 days and 14½ years. Its aetiology is unknown. The arresting lesion is a clearly defined pancreatic defect which eventually leads to pancreatic fibrosis. Two other organ defects accompany this lesion so consistently that it is almost certain they are causally linked. The first is meconium ileus producing intestinal obstruction in the newborn—this occurs in those cases in which the pancreatic lesion is far advanced at birth; the other is a pulmonary defect which terminates in chronic purulent bronchitis, bronchiectasis, and pulmonary fibrosis. The course of the disease in cases surviving for a year is almost invariably overshadowed by pulmonary suppuration, which is often staphylococcal.

The most attractive hypothesis is that the primary defect in all three situations is the production by sub-epithelial mucus glands of an abnormally viscid secretion and that this may be related to some abnormality in parasympathetic innervation. This is in all probability true of the pancreas and intestine, especially the duodenum. It is not yet fully agreed that the pulmonary suppuration is due to bronchial obstruction by an abnormally viscid bronchial mucus.

There is no question that the disease has a highly significant hereditary background due to a single recessive lethal gene which in the pure or homozygous state is causally linked with the organ defects. Direct transmission and the existence of a single Mendelian dominant can be ruled out. Consanguinity in the parents is very uncommon, strongly suggesting that the gene is not a particularly rare one. It has been found that the disease was present in 12 children out of 6,500 admissions, and in approximately 4% of a large series of necropsies in a children's hospital. The transmission is not sex-linked, as there is no sex predominance, and in the large majority of cases there are no other congenital abnormalities. It bears no relation to birth order, and cannot therefore be related to the age of the mother.

With this well-defined hereditary background it can be stated with certainty that the chances that the next child will suffer from the disease are precisely one out of four. Prognosis is clearly related to the severity of the pulmonary disease, and not necessarily to the time of onset of pulmonary symptoms.

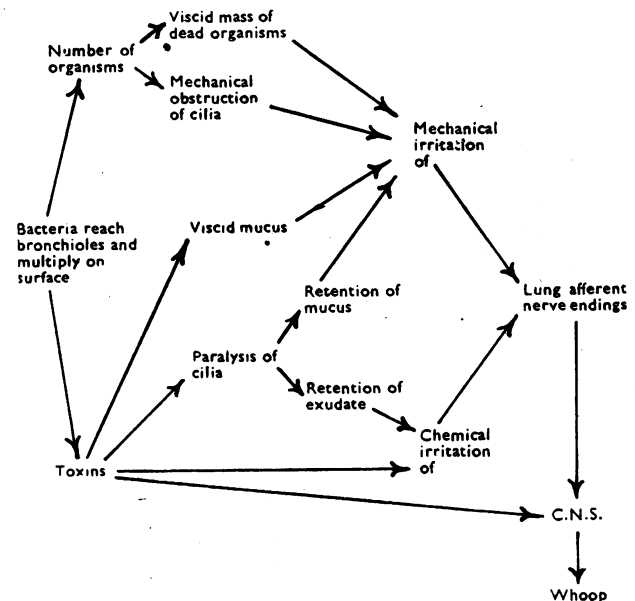
No suggestions have yet been made about prophylaxis.

The Whoop in Whooping-cough

Q.—Does *Haemophilus pertussis* have any toxic action on the cilia of the respiratory tract? I have heard that in whooping-cough the cilia are paralysed.

A.—There is no direct evidence that *Haemophilus pertussis* has any specific paralytic or destructive action on cilia. In 1912 Mallory and Hornor¹ found masses of Gram-negative organisms, indistinguishable from *H. pertussis*, among the cilia of cells lining the trachea, bronchi, and bronchioles of children dying of whooping-cough.

Organisms were crowded even between the stumps of cilia and in mucus overlying epithelium denuded of cilia. Mallory and Hornor thought that the bacteria mechanically obstructed the cilia and possibly led to their destruction. The whoop would thus be due to the local irritation of stagnant mucus and inflammatory exudate. Few now believe this to be the whole truth. Experimental infection provokes a spasmodic cough only in the human,² ape,³ and possibly monkey.⁵ But the histological changes of pertussis are neither specific nor confined to man. They occur in other bacterial and viral infections of the lung, and can be produced by the inoculation of living *H. pertussis* in apes, monkeys, cotton rats, mice,⁷ and chick



embryo.⁸ Lung sections of all these animals show masses of organisms among the cilia, a mixed mono- and polymorphonuclear exudate in the alveoli, superficial inflammation of the mucosa, desquamation of epithelium, patchy interstitial pneumonitis, and, in the later stages, obstructive emphysema and atelectasis. The mechanism of the whoop in humans is unknown. Above is a schematic representation of conceivable theories of the pathogenesis of the whoop in whooping-cough; only further work will settle which is correct.

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Correction.—In the paper by Drs. J. B. Enticknap and B. J. Stephens on "Laboratory Diagnosis of Urinary-tract Infections" (May 19, p. 1119) a mistake arose from a transposed heading on p. 1121. Under the heading "Haemolysin; Gelatin Liquefaction" the statement is made in the second paragraph: "Only five strains possessed this ability, and none of them was a true *Bact. cloacae* strain." This statement should refer only to gelatin liquefaction.

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