It is suggested that this complication may occur in patients with small stomachs, but it may be avoided by choosing an alternative operation in such cases.

We wish to thank Mr. Vaughan Ruckley, F.R.C.S.Ed., for the diagram.

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Outbreak of Coxsackie Type B2 Virus in a Children's Home in Newcastle Upon Tyne

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Brit. med. J., 1968, **2**, 532-533

Coxsackie group B viruses are seldom associated with respiratory tract infection. However, an outbreak of summer febrile illness caused by Coxsackie type B2 virus without acute central nervous symptoms or pleurodynia (Heggie *et al.*, 1960) and a similar illness in which Coxsackie B3 virus was found (Kendall *et al.*, 1960) have been described. In both instances virus isolation was higher in ill children than in those without illness; throat swabs were more often positive than faeces.

A report suggesting that Coxsackie type B5 virus was a cause of upper respiratory infection, but not necessarily of the lower tract, has also been published (Vargosko *et al.*, 1962). This view has not been generally accepted; other workers (Eckert *et al.*, 1967) have incriminated Coxsackie group B viruses in lower respiratory tract infections. Similarly, the Public Health Laboratory Service Report (1967) on 900 cases of Coxsackie B5 virus infection found that 15% were associated with respiratory disorders, ranging from cold, sore throat, croup, and pharyngitis to pneumonia, but there is still a need for additional evidence.

This communication describes an outbreak of respiratory disease associated with Coxsackie type B2 virus in a residential nursery.

The Home

The home is a converted nineteenth-century mansion, and 80 children between the ages of 2 and 15 live in the same house. Twenty toddlers live separately and have their own play-room, dining-room, and eight-bedded dormitories. They are looked after by a sister with nursery training and four lay helpers. This staff comes into contact with the other staff of the house at mealtimes. There is also an infants' nursery about 300 yards (275 m.) away from the main building, where 10 infants between 6 weeks and 1 year and five children aged between 1 and 2 live under the care of two trained sisters with a variable amount of help from lay workers from outside the home.

The Outbreak

The outbreak occurred in the group of 20 toddlers between the ages of 2 and 5 years. It began with a 3-year-old girl who was playing in the garden with the others in her group. She suddenly started to cough violently and became blue. Obviously ill, she was thought to have inhaled part of a small

plastic toy, and was sent immediately to hospital and admitted to the children's ward. Here she was found to be suffering from an acute respiratory infection, with a temperature of 101° F. (38.3° C.), tonsillitis, and laryngeal stridor. There was no evidence of a foreign body. She was treated with ampicillin and steam inhalations and made a complete recovery in five days. Unfortunately, full virological investigations were not carried out.

The next morning seven children in the toddlers' nursery were ill with fever, drowsiness, dry spasmodic cough, vomiting, and diarrhoea. All had signs of upper respiratory tract infection—that is, rhinitis, pharyngitis, and conjunctivitis. The next day a further nine children had developed similar symptoms and signs. The illness lasted for two to three days, and, after apparent improvement for two to three days, six children again became ill with the same symptoms of fever, drowsiness, cough, vomiting, and diarrhoea. On the second day of the outbreak a 16-year-old girl who helped in the nursery also became ill with cough, fever, and right-sided pleural pain. Signs of upper respiratory tract infection were present but there were no abnormal physical signs in her chest. After four days she was sent home to convalesce, but had a mild recurrence of symptoms a week after the onset of illness.

A typical history of the disease in the children is illustrated by a 4-year-old boy (Case 5). The onset was sudden. When he complained of feeling ill he was put to bed, where he vomited. On examination he was found to have a temperature of 101° F. (38.3° C.), to be extremely drowsy, to have mild conjunctivitis and pharyngitis, but no meningism or abnormal signs in the central nervous system. There were no abnormal signs in the chest. There was some improvement by the next day, but two days after the onset of his illness he relapsed with fever, vomiting, and cough. By the fifth day he had completely recovered.

The symptoms and the virological results are summarized in the Table.

All the children were treated with ampicillin, 125 mg. four times a day for seven days. The older girl was given 250 mg. of ampicillin four times a day for a week. The antibiotics did not seem to produce any dramatic improvement or prevent the occurrence of relapses.

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Five days after the outbreak of infection throat swabs and faeces were sent to the virus laboratory.

Laboratory Techniques.—Throat swabs were inoculated on to Bristol HeLa, Hep2, and rhesus monkey kidney cells. Ten per cent. suspensions of faeces were inoculated on to Hep2 and

Summary of Investigations

Case No.	Age in Months	Sex	Symptoms and Signs					Relapses	Isolations of Coxsackie Type B2 Virus	
			Fever	Vomiting	Diarrhoea	Cough	Upper Respiratory Tract Infection		Throat Swab	Faeces
1	27	M	+	+	—	+	+	—	—	—
2	38	M	+	+	—	+	+	—	—	—
3	37	F	+	+	—	+	+	—	—	—
4	40	F	+	+	—	+	+	—	—	—
5	49	M	+	+	—	+	+	—	—	—
6	25	M	+	+	—	+	+	—	—	—
7	27	F	+	+	—	+	+	—	—	—
8	28	F	+	+	—	+	+	—	—	—
9	49	F	+	—	—	+	+	—	—	—
10	37	F	+	—	—	+	+	—	—	—
11	33	F	+	—	—	+	+	—	—	—
12	20	M	+	—	—	+	+	—	—	—
13	25	F	—	—	—	+	+	—	—	—
14	18	M	—	—	—	+	+	—	—	—
15	18	F	+	—	—	+	+	—	—	—
16	16 years	F	+	—	—	+	+	—	—	—

monkey kidney (cynomolgus) cells. The techniques and detailed methodology have been described previously (Gardner *et al.*, 1962; Gardner and Cooper, 1964). The virus results are included in summary form in the Table.

Comments and Conclusions

The sudden onset of symptoms, their relative severity, and the high rate of infection among the toddlers prompted us to investigate the cause of this outbreak. All the children had evidence of upper respiratory tract infection and a cough. The unusual features were the high incidence of gastrointestinal symptoms, the marked degree of prostration, and the biphasic illness in 7 of the 16 cases. The oldest patient was a girl of 16 who was helping to look after the children; her symptoms were typical of Bornholm disease.

Preliminary Communications

Antilymphocytic Serum and Tumour Dissemination

Brit. med. J., 1968, 2, 533–535

Chemically and virally induced tumours are known to evoke immune serum antibodies (Old and Boyse, 1964; Klein, 1966), but the role of immunity in the development and dissemination of spontaneously occurring tumours is uncertain. Investigation of the effects of immunosuppression, which might help to clarify this problem, has been hindered by the fact that the most potent immunosuppressives are also anti-tumour agents. A further difficulty is that experimental metastases are generally unpredictable and uncontrollable.

It seems possible that disseminating tumour cells can become established as metastatic growths only when a degree of immunological paralysis has been produced, and that immuno-

That the illness was confined to the toddlers, with an absence of symptoms among both older and younger children, suggests that the organization of the home into groups with their own staff prevented a much more widespread outbreak.

A major problem in any investigation of illness in a residential nursery is the presence of asymptomatic endemic viruses. Nursery carriage of adenoviruses and enteroviruses in stools has been described previously (Gardner *et al.*, 1961; Gardner and Cooper, 1964), but excretion was not associated with clinical symptoms. In this nursery we were unable to examine normal children as "controls." The close association of symptoms with isolation, both from throat swabs and from stools, suggests that there was a close relation between illness and virus. This is further supported by the occurrence of a Bornholm type of disease in the adolescent patient and also by the fact that one of us has had the nursery under her observation for over 12 years, during which time there have been no similar outbreaks.

We have described this outbreak in the hope that similar outbreaks in other residential nurseries will be investigated. In this way more evidence of the role of Coxsackie viruses—which may be excreted by the normal population—in respiratory disease will be obtained.

Summary

An outbreak of acute respiratory illness confined to one group of children in a residential nursery in Newcastle upon Tyne is described. Evidence is presented which suggests that the outbreak of illness was due to Coxsackie type B2 virus.

Our thanks are due to the Reverend Mother of Nazareth House and the sister and staff of the nursery for their co-operation and assistance in the collection of specimens.

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suppressive agents might accelerate this process. The finding that antilymphocytic serum has powerful and relatively specific immunosuppressive properties (Levey and Medawar, 1967; Woodruff *et al.*, 1967), with no apparent anti-tumour effects, has facilitated examination of the problem of tumour dissemination and metastases formation.

The influence of antilymphocytic serum was therefore examined on three transplantable murine tumours—the Lewis lung carcinoma (3LL), which arose spontaneously and which regularly metastasizes to the lungs (Karrer *et al.*, 1967); the lymphoid leukaemia L1210, which, like most leukaemias, disseminates widely; and the sarcoma BP8/P1. These last two neoplasms were originally chemically induced, the L1210 by methylcholanthrene and the BP8/P1 by benzpyrene.

MATERIALS

Tumours.—The Lewis lung carcinoma (3LL) was originally obtained from Microbiological Associates Inc. and was main-