over a period of at least 12 months. It may well be that other chemotherapeutic reagents should be considered as well.

Summary

Of 63 children treated for Wilms' tumour during the past 21 years, 16 developed metastases confined to the lung, shortly after the initial treatment. Treatment by operation, radiotherapy, and chemotherapy or a combination of these methods can give reasonably good results in children suffering from pulmonary metastases secondary to Wilms' tumour. 7 of the 16 patients are alive and well 1½ to 21 years after they developed clinically recognizable pulmonary lesions.

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Sputum Viscosity and Pulmonary Function in Cystic Fibrosis

The development of the pulmonary lesions in cystic fibrosis (CF) has been attributed to obstruction of the airways by abnormally viscous mucus (Farber, 1944). We have examined the relation between sputum viscosity and pulmonary function in CF.

Patients and Methods

The patients studied (Table) were described in a previous publication (Feather and Russell, 1970a). Of a total of 30 patients with CF in the North-Eastern Hospital Region of Scotland, only the 5 described regularly produced sputum. During the period of study patients were in a clinically stable phase of their illness and their usual therapy remained unchanged.

TABLE
Details of Patients with Cystic Fibrosis

Case No.						Age (yr.)	Sex
1	..	..	..	..	..	7	M
2	..	..	..	..	..	10	M
3	..	..	..	..	..	6	F
4	..	..	..	..	..	19	F
5	..	..	..	..	..	15	M

The sputum specimens studied were expectorated spontaneously during the first hour after waking; no means of liquefying the sputum was used before expectorating the samples. Apparent viscosity at 900 sec.⁻¹ of each sputum sample was measured within two hours of expectoration on a cone and plate viscometer, as described elsewhere (Feather and Russell, 1970a). A significant correlation has been shown between this and other measures of sputum viscosity in these patients (Feather and Russell, 1970b).

The forced expiratory volume in one second (FEV_{1.0}) and forced vital capacity (FVC) were measured by means of a dry spirometer.* On each occasion the best of three measurements taken before, and the best of three taken after the inhalation of isoprenaline were recorded. To avoid the inclusion of any reversible airways obstruction (present at times in all the patients studied) the 'over-all best' (i.e. before or after the inhalation of isoprenaline) FEV_{1.0} and FVC were recorded. All volumes were converted to BTPS and expressed as a percentage of the predicted value. Predicted values were obtained from the data of Strang (1959) supplemented for the FVC of Case 3 by those of Lunn (1965).

Results were obtained during the control period for the trial of tolazoline, previously reported (Feather and Russell, 1970a). Sputum viscosity was measured on the same day and as close in time as possible to lung volume measurements. Measurements were made on days 4 and 7 of each week. The data for the Fig. were obtained during week 1.

To examine the relation between day-to-day changes in sputum viscosity and changes in pulmonary function, these measurements made on the same day during the period of observation were compared. Because tolazoline had no demonstrable effect on either sputum viscosity or respiratory function, results obtained during the four weeks of observation were pooled.

Results

The Fig. shows the relation between FEV_{1.0}, FVC, and the viscosity of sputum in individual patients. The correlation coefficients for viscosity with FEV_{1.0} and FVC were significant and negative (for FEV_{1.0} $r = -0.92$, $p < 0.05$; for FVC $r = -0.903$, $p < 0.05$). No relation was shown be-

*Vitalograph, Vitalograph Ltd., Buckingham, England.

FIG.—The relation between sputum viscosity and FVC (●) and FEV₁₋₀ (×) measured on the same days in 5 patients with CF. FEV₁₋₀ and FVC are expressed as percentages of the predicted values. The linear regression equations for these relationships are: % predicted FEV₁₋₀ = $88.4 - 0.47$ apparent viscosity at 900 sec^{-1} ; % predicted FVC = $98.9 - 0.45$ apparent viscosity at 900 sec^{-1} . The slopes are almost identical and at low viscosities pass close to 100% on the y axis.

tween day-to-day fluctuations in sputum viscosity and changes in the results of pulmonary function tests during the period of study.

Discussion

In the 5 patients studied, sputum viscosity was strongly negatively correlated with pulmonary function. Because patients producing the most viscous sputum also produced the most purulent specimens, the presence of infection may have influenced the results. However, as Cases 1, 4, and 5 produced the same number of purulent specimens, and significant differences have been shown between the viscosities of sputum samples from different patients regardless of purulence (Feather and Russell, 1970b), it seems likely that purulence is not the only factor involved.

It is of interest to note that all of the 5 patients studied showed, at some time, evidence of reversible airways obstruction, which some workers have found to be absent (Cook *et al.*, 1959; Beier *et al.*, 1966). Our patients were selected in that they were all able to produce sputum, and this could be related to Mearns's (1968) suggestion that reversible airways obstruction might be indicative of insidious infection. This author noted response to isoprenaline to be most frequent in the group with a FVC of 60–79% of that predicted; the FVC of our patients ranged from 36–92% of the predicted values.

The relation between sputum viscosity and dynamic lung volumes could have arisen either because patients with the highest sputum viscosity eventually develop the most severe pulmonary lesions, or

because sputum viscosity increases as the severity of the respiratory disease progresses. Though no correlation could be shown between day-to-day changes in respiratory function and changes in sputum viscosity in individual patients over a four-week period, it would be of interest to study more patients over a longer period of time.

Summary

A significant negative correlation between dynamic lung volumes and sputum viscosity has been shown in five patients with cystic fibrosis.

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Temporary Neonatal Hyperglycaemia

Since the description by Hutchison, Keay, and Kerr (1962) of the clinical syndrome of congenital temporary diabetes mellitus, sporadic reports of neonatal hyperglycaemia have appeared. A further example is reported here, which differs from previous accounts in that the condition had resolved within 24 hours, and is thus most probably of different aetiology.