oscillations are inverse, pressure being lower with expiration than with inspiration. Cases have been described where air has been introduced below the diaphragm.

If the manometer registers a positive pressure which gradually becomes higher the needle is probably in a blood-vessel and blood will pass up the tubing. If air is forced in under these circumstances there is, of course, a danger of gas embolism.

It sometimes happens at the initial operation that the lung is punctured by the needle so that air escapes from the alveoli. These small punctures heal very quickly and as a rule do no harm, but air may escape from them for some time and this probably accounts for the occasional rise in intrapleural pressure or increase of collapse, as shown by X-ray, which is sometimes found to be the case where no refill has been given.

The two serious dangers at the induction are :—

(1) PLEURAL SHOCK.

This is extremely rare, but is a definite danger, and according to figures is as likely to happen whether or not the pleura has been anæsthetized. I always make a point of anæsthetizing the pleura at each refill as well as at the initial induction as this makes the procedure painless and gives one a feeling of security against pleural shock.

(2) GAS EMBOLISM.

This has now been described as of historical interest only and certainly it should not occur with proper technique.

The safeguards are in the first place to see that the air introduced into the pleural cavity is not under positive pressure, and secondly to avoid introducing any air even by suction until oscillations on the manometer show that the needle is really in the pleural cavity.

THE SERUM TREATMENT OF PNEUMONIA.

BY G. J. LANGLEY, M.B.E., M.D., M.R.C.P.LOND.

Physician, Ancoats Hospital, Manchester, &c.

As Wm. Withering pointed out some century or more ago, the appraisalment of a remedy is probably one of the greatest difficulties in medicine. More particularly is this so in pneumonia, because the mortality-rate in various epidemics differs very widely ; this variation is known not to depend upon the type of the infection. It follows that any evaluation of a serum can only be made on a rigid basis of no selection with alternate case control.

Such investigations have been made, mostly in America, and the results have been published. The first successful serum employed was effective against Type I pneumococcus only and required to be used in large volume and given intravenously at eight-hour intervals. The mass of serum so employed was mechanically difficult and inconvenient to administer and gave rise to somewhat violent and alarming reactions. For this and other reasons the method never became popular in this country, although careful American records showed very good results.

A further step in treatment was made when Felton showed that the antibody was contained in the euglobulin fraction which could be completely precipitated by large dilution with distilled water. Re-resolution in saline was easily possible without loss of protective efficiency and this has enabled a high grade of concentration to be reached. The dose of the serum to be administered has been thereby greatly reduced, but it is still only effective against Type I infections, double the dose being probably necessary for equal results in Type II disease.

It is impossible to deal with this subject without referring shortly to methods of typing the pneumococcus. This offers some difficulties to the clinician on the grounds of time. It is essential that typing should be completed in twelve hours, and various methods have been introduced. One method is to emulsify a sample of sputum in saline, inject it into the peritoneal cavity of a white mouse, and repuncture the peritoneal sac again after four hours, when a small sample can usually be obtained; this can be mixed with high-titre serum in appropriate dilution, agglutination and swelling of the homologous organism will take place, thus giving the type.

It is essential that typing should be carried out, as the serum is ineffective against Type III and Group IV infections. The necessity for this depends to some extent upon the frequency of Type I and II infections in this country, and although there are only a limited number of observations, yet it would appear that these groups are responsible for perhaps 70 per cent. of cases. Such a percentage would justify the use of the serum in all cases, since the alternative of expectant treatment can never be very attractive, but the high cost of the serum still precludes such a course in the majority of cases.

The dose and efficacy of the treatment are well shown in an article by Sutliff and Finland (*Journal of the American Medical Association*, May 2, 1931). A summation of the results, all of which have been done on a basis of rigid no-selection alternate case control, yields the results shown in the Table. When this is compared with the fully recognized results of the early treatment of diphtheria by adequate serum administration, it will be seen how large a step has been taken in the direction of cure of pneumonia. The mortality fall from 33·4 per cent. to 14·7 per cent. is surely a sufficient recommendation for the treatment concerned.

		Specifically treated by concentrated antibody (Felton)			Not specifically treated (Control)		
		Cases	Deaths	Per cent.	Cases	Deaths	Per cent.
All patients	...	377	78	21·5	358	114	32·5
Less than 3 days' duration	...	174	22	14·7	141	42	33·5