While experimental evidence, the effect of chloroform and of ether upon respiration led him to believe that the former was seven times more dangerous. This is important, as deaths due to anæsthetics when they arise from overdosage, as opposed to what may be called accidental conditions, are brought about mainly through the poisoning of the centres in the medulla oblongata. But as has been pointed out above, the incidence of death is largely dependent upon the condition of the patient before such as to be affected adversely by particular anæsthetics, and so it is necessary to consider briefly what are the distinguishing actions of the commoner anæsthetics, and their bearing upon pathological lesions of the systems concerned with the processes of life.

Chloroform produces hæmolysis, as does ethyl chloride in a less degree. Chloroform also diminishes the activity of glandular cytoplasm, and chemically acts as a protoplasm poison, destroying tissue life. Its effects upon the tissues vary directly with the nature of the latter, the nervous tissues suffer most, the heart muscle more than the voluntary muscles, and the latter more than the involuntary: the liver, as the most vulnerable of the viscera, then the kidneys. This is perhaps best understood by stating that if the various tissues are subjected to chloroform containing fluids, the percentage strength required finally to inhibit function, and ultimately to destroy the tissue, power of functionating, is lowest in the case of the highly-organised tissues, such as nerve cells and fibres, while in the case of other tissues, higher and higher strengths or percentage values have to be used to inhibit or destroy. The elimination of chloroform is comparatively slow, and any interference with the functional activity of the renal emunctories, such as progressively occurs as chloroform is absorbed, their excretion more and more, tends to the accumulation of the anæsthetic, and its storing up in the tissues, with disastrous effects. Where, however, care is taken to avoid such a strength of vapour as produces the inhibition of tissue function, this danger is avoided. The dominating features of the action of chloroform are: depression of the activity of the heart, lowering of blood-pressure, and lessening of pulmonary ventilation and so of gaseous interchange during respiration. All these effects are progressive, but being a function of the strength or percentage value of the vapour employed, are more or less under the control of the administrator, as he can and should lessen the strength of the vapour inhaled after induction is complete, and through the maintenance of anæsthesia.

Ethyl chloride and ethyl bromide, so far as we know, behave similarly; but as they are seldom employed for any but brief periods, little is definitely known of their prolonged effects. As ethyl chloride is far more volatile than chloroform, the prognosis is more favourable in the case of the former than of the latter.

Ether causes hæmolysis, but unless asphyxial complications are permitted, its effect is slight in this direction. It stimulates all the cells except those concerned in the urinary function. The secretions