tightly; the dangers of asphyxia will be greatly increased by such a constricting effect, and there are good grounds for believing that they take an important share in bringing about the fatal result. I would commend this point for consideration and further evidence.

This concludes my list, though it must not be taken to comprise all the conditions which may result from binding. I venture to hope, however, sufficient evidence has been given to justify a strong condemnation of the common custom.

THE INK POLYGRAPH.

By J. MACKENZIE, M.D.,

LONDON, W.

I EXHIBITED at the meeting of the Medical Section of the British Medical Association in Toronto in 1906 a method of recording the movements of the circulation by means of an ink polygraph. I have not hitherto published a description of this method as there has been some difficulty in getting the instrument made, and the maker until lately has not been able to meet the demand for the instrument.

A long experience in taking graphic records of the movements of the circulation impressed me with the fact that there were many features in these movements which

somewhat like that belonging to a Jaquet sphygmograph, is fastened to the wrist in such a manner that the pad of the steel spring falls on the radial artery and is pressed down by an eccentric wheel, 18, until a suitable movement is transmitted to the spring by the artery; then the broad tambour, c, is fitted on to the splint so that the knob, 12, falls on the moving spring. This wrist tambour is connected to the tambour, B, by india-rubber tubing, 22, 22, and the movements of the radial pulse are recorded by the lever, F. The shallow cup (receiver), E, is placed on the pulsation which it is desired to record, and the movement is conveyed to the lever, F, of the other tambour. In this way simultaneous with the radial pulse a record can be obtained of the apex-beat, carotid, jugular, or other pulses.

To record the respiratory movements a bag can be substituted for the receiver, E.

By turning the screw, 3, the rate at which the paper passes can be quickened or slowed at will. This is of the greatest use, for it often happens that in quickly succeeding events a wider interval may be required, whereas in recording respiratory movements a slow rate is best. As the time-marker registers one-fifth of a second and is driven by a separate clockwork, the rate of the recorded movements can always be ascertained with absolute accuracy.

It has been suggested that another tambour should be added to record three movements, and I have tried this,

it was impossible to investigate satisfactorily by the methods in vogue. Changes in the heart's contraction that occurred at infrequent intervals, or in great variety, were apt to be overlooked, while the relationship of the respiration has never been satisfactorily worked out. There was a necessity, therefore, to devise a method by which tracings could be taken over a period of time of considerable duration. I conceived the idea that if a roll of paper could be unwound and levers could be made to inscribe the movements in ink, the end I had in view would be achieved.

I had considerable difficulties to overcome, but found a skilled helper in Mr. Shaw, who not only comprehended and appreciated my ideas, but constructed an instrument that carried them out. The case, A, in the accompanying figure contains the clockwork for the roller which unwinds the roll of paper, D, and also the separate clockwork which moves the time-marking pen; B, B are the two tambours, and F, F their levers, one of which is represented raised, while the pen of the other is resting on the paper. The writing pens are narrow, grooved wires, one end fixed to the bottom of a small cistern at the free extremity of the lever. The other end of the grooved wire is adjusted barely to touch the paper. The ink is put into the tiny cistern, and it flows along the grooves to the pen-point by capillary attraction. If the pens are kept clean and the ink is free from dust, they serve their purpose most admirably and are ever ready for use.

As the radial pulse is the most serviceable of standards, a special method is employed to record it. A splint, c,

but I have practically discarded it, as, though it might be of use occasionally, it would complicate the apparatus unnecessarily. When making observations single-handed the two tambours are quite sufficient to occupy attention. With a little practice this apparatus can be used with the greatest facility. In the course of a few minutes the different movements can be recorded with the patient sitting up or in the recumbent position.

When the tambour is strapped to the wrist to take the radial pulse, one hand is always free to start the machine and to replenish the ink or regulate the rate, the other hand holding the receiver over the movement to be recorded.

The instrument is made by Mr. S. Shaw, instrument maker, Padiham, Lancashire.

UNDER the will of the late Mr. Richard Henry Wood, of Sidmouth, and formerly of Rugby, the West of England Eye Infirmary, the Devon and Exeter Hospital, and the Hospital of St. Cross, Rugby, each receives a sum of £1,000.

A BOOKLET can now be obtained from the agencies of the Royal Mail Steam Packet Company giving an interesting account of South America from a tourist's point of view. It includes a list of possible trips and of the expenses out and home. It appears to be readily feasible to visit Vigo, Lisbon, Madeira, Pernambuco, Bahia, and Rio de Janeiro in five weeks at an expense of £53. A visit to Santos and Buenos Aires takes somewhat longer. From both Buenos Aires and Rio de Janeiro inland expeditions can be made, the passenger re-embarking at a fresh port.