closed and a slight pressure on *M* forces a portion of the contents of the flask through *N* and up *B* until the portion *C* is filled, when the stopcock, *E*, is closed. The whole pressure on the flask can then be relieved by opening the pinchcock, *H*. The liquid in *C* clears very rapidly and the standard barium chloride solution may be added. If this produces a turbidity, *E* is opened and the solution washed down into the flask ; a very complete mixing is then obtained by alternately compressing *M*, with *G* open to the air, placing the finger on the orifice of the short rubber tube, *K*, and releasing *M*, thus causing air to be drawn through *N* and to bubble through the solution.

The process of forcing the liquid up the tube, titrating, washing it down again, and mixing is repeated until a further addition of barium chloride solution causes no turbidity. The mean between the number of c.c. used up to the point of having an evident turbidity and the quantity necessary to the point where none is perceptible is taken as the amount of barium chloride solution consumed in the precipitation of the sulphate. As the amounts of barium salt and sulphate in solution approximate to each other, so the rapidity of the clearing increases, and when the reaction has almost reached the end-point this clarification is very nearly instantaneous.

Experiments were undertaken in this apparatus with the solutions of sulphates and barium salts given in the following tables :

TABLE I.

Using 0·0958*N*– H_2SO_4, 1 c.c. = 0·0046 gram (SO_4).
„ 0·1101 *N*– $Ba(NO_3)_2$, 1 „ = 0·00485 „ (SO_4).

No. of c.c. of H_2SO_4 taken.	Equal to gram (SO_4).	No. of c.c. of $Ba(NO_3)_2$ taken.	Equal to gram (SO_4).	Error in per cent.
10·42	0·0479	10·00	0·0485	– 1·0
10·60	0·0488	10·00	0·0485	+ 0·6
10·52	0·0484	10·00	0·0485	– 0·2
10·58	0·0487	10·00	0·0485	+ 0·4
16·80	0·0773	16·00	0·0776	– 0·3
15·71	0·0722	15·00	0·0727	– 0·7

Average error – 0·55 and + 0·5, giving a mean error of 0·025 per cent.

TABLE II.

Using 0·9981 *N*– H_2SO_4, 1 c.c. = 0·0479 gram (SO_4).
„ 0·1101 *N*– $Ba(NO_3)_2$, 1 „ = 0·00485 „ (SO_4).

No. of c.c. of H_2SO_4 taken.	Equal to gram (SO_4).	No. of c.c. of $Ba(NO_3)_2$ taken.	Equal to gram (SO_4).	Error in per cent.
5·05	0·2419	50·00	0·2425	0·4
5·08	0·2433	50·00	0·2425	0·4
5·09	0·2438	50·00	0·2428	0·5
			Average error............	0·43