and committee; at the Royal College of Physicians, by Lord Dawson, of Penn, and Lady Dawson, and the one by Dr. and Mrs. Singer, as already mentioned. On Friday evening a banquet was held at which various delegates spoke.

DAVID EUGENE SMITH

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A TRIPLE-SPECTRUM DISCHARGE TUBE

THE mercury-vapor lamp is probably the most generally useful light source for spectroscopic, optic and general instruction laboratories. Many times, however, the supply of lamps is not equal to the demand, and the availability of inexpensive substitutes is very desirable. For this reason the possibilities of the electrodeless discharge were investigated, and it was thought that the results obtained might be of general interest.

A pyrex glass tube A about 20 cm long and 4 cm in diameter was provided with a side tube B and a "sucked-in" thin glass end C.[1] Ten grams each of zinc, cadmium and mercury were placed in the tube. The tube was placed in an oven and baked at 450° C. for several hours, while the gases in the tube were removed by a mercury diffusion pump. During the baking-out process the mercury was kept in B, which was arranged to be out of the oven. Just before the tube was sealed off at D, the mercury was distilled from B to A.

The completed tube was mounted in an asbestos box equipped with two "Glo-coils" as shown in the figure.

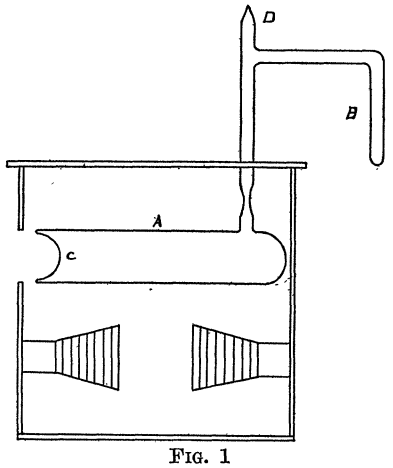

FIG. 1

A helix of 8 turns of No. 8 copper wire was placed around A. The helix was connected in series with a variable spark gap and the secondary of a 1 K.V.A. Thordarson transformer. Three Leyden jars were connected in parallel with the helix. The variable spark gap, which was enclosed in a sound-proof box, is essential to obtain a discharge which fills the entire tube. In order to prevent the mercury from depositing on C while the tube is in operation, the helix should extend well to the end of the tube. Best results are obtained if large-sized wire is used for all electrical connections.

Three quite distinct types of discharge may be obtained with this tube.

(1) If all the mercury is left in A and the tube slightly warmed, a discharge quite comparable in intensity to ordinary mercury arcs results. Mercury and zinc lines are prominent. In the present case the thin glass window transmitted with great intensity ultra-violet radiation to 2,536 Ang.

(2) By heating the tube strongly a large part of the mercury may be distilled to B and the discharge becomes bright green. In this case the visible spectrum consists largely of the strong mercury lines and the cadmium triplets.

(3) If practically all the mercury is distilled to B, the tube may be operated to give a very steady discharge even when cold. In this case mercury, zinc and cadmium lines are present. The cadmium red line—the international standard—appears quite strongly under these conditions.

The result is an inexpensive but brilliant light source which transmits the ultra-violet well and which produces lines extending well into the red—facts which make the tube desirable for spectroscopic calibration. The lines are very sharp, since the tube may be operated at low temperatures and the Doppler effect is small.

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[1] C. M. Slack, *J. O. S. A.*, 18, 123, 1929.

THE ADJUSTABLE DOUBLE SLIT

MR. R. WILLIAM SHAW recently (SCIENCE, Vol. 73, April 24, 1931) described an ingenious mechanism permitting the continuous variation of the distance between two optical slits. A more complicated apparatus with means for adjusting also the widths of the two slits was devised by L. E. Dodd and G. H. Jung. (J. O. S. A. and R. S. I., Vol. 15, p. 181, 1927.) Adjustable double slits have been used chiefly for laboratory repetition of Michelson's stellar interferometer experiment.

The special problem of the adjustable double slit is, as Shaw points out, that of keeping the varying space between the slits closed. Shaw accomplishes this by sliding between the slits a tapering brass plate; Dodd and Jung employ a rolling curtain, similar to a window shade.

A method used here with success may be worthy of record on account of its simplicity. Two thin, rectangular plates, which may be of either cardboard