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A NEW RADIATION LAMP FOR LOCAL THERAPY

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THIS lamp has been designed to meet the demands of those who desire an instrument of moderate price which will carry out all the usual functions of an ultra-violet lamp for irradiation of the eye. No attempt will be made here to describe its application, nor will the question of the indications for its use be entered into, since this has been adequately dealt with elsewhere; this short article will merely give a description of the design of the lamp, and its mode of employment.

For convenience of manipulation and efficiency, it must be freely admitted that the original lamp designed by Duke-Elder and described in this Journal, 1927, leaves little to be desired; but it, and also an even lower-priced instrument since designed by Rycroft, suffer in the writer's opinion from being far too expensive, their cost being prohibitive for small institutions where the use of such a therapeutic agent, though valuable, is limited. It has been the writer's primary endeavour to reduce the price of the instrument here described to a minimum, and at the same time to lose nothing in efficiency or ease of application.

The apparatus, which is sketched diagrammatically in Fig. 1, consists essentially of a mercury vapour lamp and a quartz optical system for concentrating the energy emitted. The lamp (Hg) is

mounted in a suitable housing which has a removable ventilated roof carrying a filtered inspection aperture (I). The housing and lamp are mounted on a beam (A) which is supported at its point of balance by a heavy base (B). In the side of the housing, opposite the incandescent mercury tube, is the condenser lens (C) protected by a short tube which carries at its end an iris diaphragm (D); this diaphragm replaces the usual wheel of apertures and is found more convenient and efficient in actual use, as well as simpler. At the far end of the beam is the projector lens (P) mounted centrally in a flange (F2) which prevents the access of any scattered radiation

FIG. 1.

to the patient's face. Centring of this lens in the vertical plane is permitted by its being carried on a metal cylinder fitting exactly over a peg which is part of a rectangular mounting; this mounting provides for focusing of the light by its sliding along the beam, and for fixation by the locking screw (S2). An intermediate tube (I.T.), the interior surface of which is finished a dull black, intervenes between the lenses, and carries at its source end a wider flange (F1) further to prevent scatter. (Though filters have been found by the writer to have a practically negligible use in local therapy, should they be desired this intermediate tube would provide a very convenient means of incorporating them; a simple drop slit is suggested to this end.) The mounting of the intermediate tube is also capable of alteration of position on the beam, and is fixed by a locking screw.

Several points in the optical system deserve special mention.

In the first place it has been simplified by being reduced to two lenses; though quartz is used as a lens material on all such lamps, some absorption still occurs, and the elimination of the usual middle lens results in a higher final output of ultra-violet rays. The condensing lens is of compound type of ultimate strength 22D.; the system is of new design and is so worked as to produce an even field of illumination from what is essentially an astigmatic source—a device which, so far as I know, has not been utilized before. The most important feature of the projector lens consists

FIG. 2.

in its having an aperture of 36 millimetres, which is greater in excess of that of previous systems, and is a decided advantage. The practical result of such a system is that any type of lesion of the globe or lids which it is desired to treat can be suitably irradiated; by the combined manipulation of the aperture of the iris diaphragm and the position of the projector lens, a focused circle of light of any diameter from 2 to 50 millimetres can be obtained.

The beam is mounted on the stand through a pin-joint, which allows of vertical adjustment and is clamped by a butterfly-nut (N); adjustment in the horizontal plane is provided by a peg-joint which is also capable of being fixed by a thumb-screw (S1). Finally, the whole apparatus can be moved into position by sliding over the glass top with which the table is provided, contact between the

and the base being through cork pegs, which are found to give the desired combination of steadiness and relative ease of movement.

The instrument is used on a table which is a slightly modified form of the standard adjustable table made by Messrs. Clement Clarke of Wigmore Street. It has been found quite satisfactory—in the case of some patients, the alteration is an improvement—to dispense with a chin- and head-rest; the patient's elbows are rested upon the table which is adjusted to a suitable height, and the chin rests in the cupped hands. The alterations of the patient's positions

FIG. 3.

are more easily carried out when the head is steadied in this way than when a chin rest is used; the lids are as usual held open by an assistant only if necessary.

A photograph of the apparatus is shown in Fig. 2, and one of the apparatus in use in Fig. 3. The mercury vapour lamp runs at 2 amperes, the ordinary mains current being suitably converted by the use of a resistance. Ease of starting is ensured by mounting the lamp on a rocking device actuated by a lever on the housing shown at H. Fig. 1. The apparatus is made by L. H. Miller, of 6, Lannoy Road, New Eltham, S.E.9.

I would like to take this opportunity of expressing my indebtedness to him for his ready co-operation, and for many useful suggestions with regard to details of construction. I understand that the price of the instrument is not yet definitely fixed, but that this will certainly not exceed £24, inclusive of the resistance.