

EUTHYSCOP



The Euthyscope by Cüppers

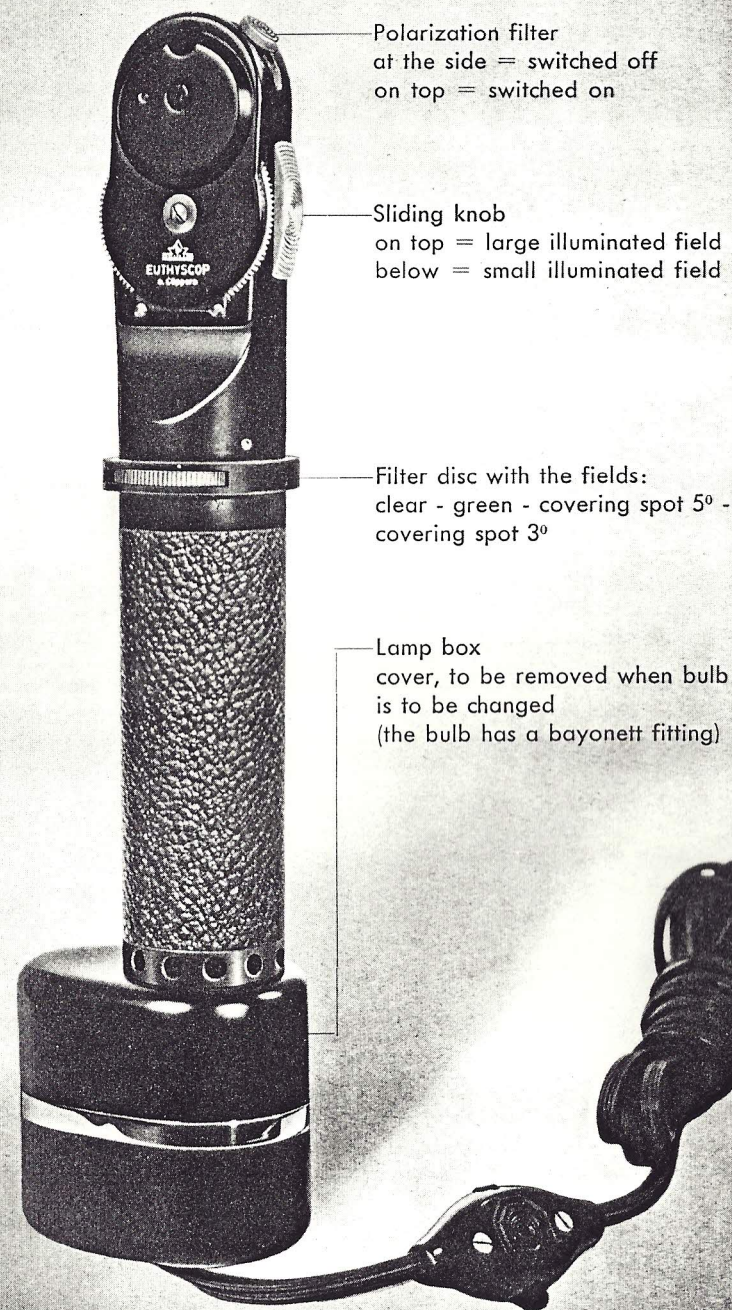
The Euthyscope according to Cüppers is a new Ophthalmoscope which has the following specialities in comparison with any previous ones.

- 1.) The intensity of the illumination may be increased to more than that of the usual ophthalmoscopes.
- 2.) A system of lenses placed in the path of the illuminating ray allows a choice of the following possibilities for examinations of the fundus.

a) With a concentrated ray — creating a small, circular, illuminated field of 7° — for the purpose of examining the fundus with the fullest intensity of the light; primarily to carry out a retinoscopy with reversed projection under unfavourable conditions, e. g. in rooms where there are no means of obscuring the light, or if there are opacities of the media.

Practically all disturbing light reflection on the various reflecting surfaces (lens, cornea) is prevented by the use of detachable polarizing filters. As the irregular, or diffused reflection of the illuminating ray is diminished, it also facilitates the examination of the fundus in, for example, cases of corneal scarring or opacities of the vitreous body.

b) With a strongly divergent ray — giving a large, circular, illuminated field of 30° — to obtain a general view of the fundus such as is important in cases of hypertony. Also by the insertion of polarizing filters it is easier to distinguish between spastically increased reflexes and organic alterations of sclerosed vessels. Above all, by the use of this large illuminated area amblyopia treatment may be carried out by the following method. A green filter prevents dazzling the area so that macula can be found. Then two spots are inserted into the middle of the light field, thus protecting the macula zone from illumination and in this way an after-image is created. According to CÜPPERS, this is the basis for the treatment of amblyopia.



Principle of Treatment of Amblyopia

Two points are characteristic of the functional disturbances of the amblyopic eye:

- 1.) The angular visual acuity is diminished
- 2.) The symptoms resemble those of agnosia

It is the normal, or approximately normal, acuity that must be established before any further steps in the treatment are taken. As regards the procedure of treatment amblyopia must be divided into 2 groups.

- a) The cases in which only macula suppression occurs while the directional gaze of the fovea is still maintained.
- b) Cases in which macula suppression occurs and the fovea loses its "straight ahead" localisation and hands it over to an eccentric retinal point. In this second group, eccentric fixation is maintained by a real change of localisation over the whole of the retina. Therefore treatment by occlusion of the good eye is not possible, as the visual acuity

could not become better than that which the eccentric retinal point is able to resolve.

In accordance with this, the wrong localisation must first be broken down or at least must not be allowed to develop any further by permanent occlusion of the amblyopic eye.

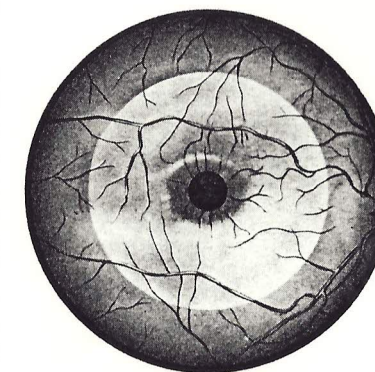
The question is, however, whether the amblyopic fovea can regain the "straight ahead" physiological value together with an increase in its function. The following technique is recommended:

- 1.) If the retina of the posterior pole of the amblyopic eye is illuminated (under control of the examiner's eye) by using the light field of 30° and the covering spots are placed on the fovea of this eye, a strong after-image will arise which has a complementary cen-



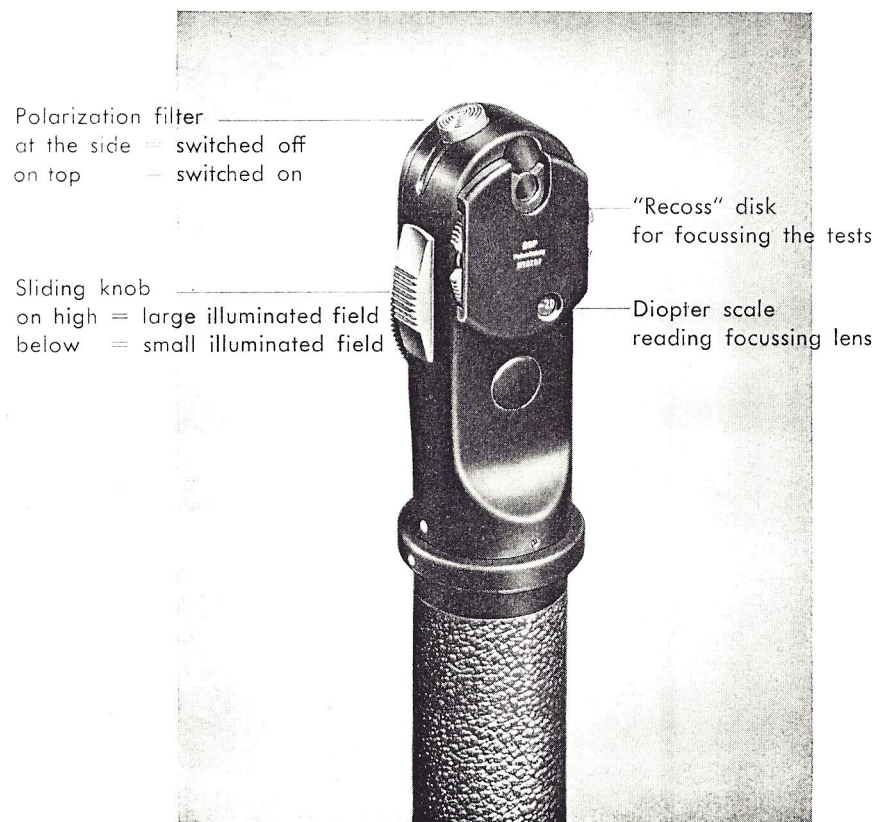
tral field of 5° or 3°, according to the size of the spot chosen.

- 2.) Thus the negative after-image shows a central light field in the middle of a dark grey ring. The light area corresponds to the fovea centralis or the macula. In this way the patient is able to become conscious of the position of his fovea. With the use of this foveal visual field, fixation- and reading-exercises help to regain the physiological directional gaze and so the central fixation.



For this purpose the patient is asked to project the light centre on to reading mark which is presented at a distance of 3 or 5 or 6 metres. At the beginning of the training it is advisable to create the after-image first on the non-amblyopic eye, in order to help patients, especially children, to understand the requirements which are connected with this method of treatment.

- 3.) It is by the occurrence of the negative after-image that the position of the pathological irridiability in the amblyopic eye is reversed and is so adapted to physiological conditions. This is the reason that this method may also be used in cases of amblyopia without eccentric fixation. The macula regains functional power over the adjacent area. This functional increase is not only relative but absolute. The macula suppression gradually disappears under the reversion of the after-image. It is of importance if, in the course of this treatment the eccentric fixating spot is not also illuminated if it perhaps lies in the marginal zone of the papilla.



Special Directions for Treatment

- 1.) A successful treatment depends upon the possibility to produce a negative after-image in the amblyopic eye. It is note worthy that in many cases of amblyopia the after-image does not appear spontaneously, or it appears very fleetingly. It is, however, nearly always possible to gain the change from a positive after-image to a negative one, by dividing the room into dark and light periods by means of a flashing lamp. Also by this technique the duration of the negative after-image is lengthened and its brightness intensified.
- 2.) It is necessary to point out that an illumination which is too strong, almost "blinding" or which lasts too long, may prevent the after-image from appearing and changing, thus diminishing the therapeutical success. The transformer should be regulated from 4,50 to 5 volts, and the limit of the duration of the illumination up to 30 seconds. Only cases of ocular nystagmus are excepted from this rule. Here, this disadvantage of a strong "blinding" cannot be avoided as the intense illumination is necessary to diminish the movements of the eye.
- 3.) In order to avoid blinding the macula area at the beginning of the treatment, the green filter is used while examining the fundus.
- 4.) According to our experience, the more difficult it is to provoke a negative after-image, the more dubious is the prognosis of the case.
- 5.) It must be added as a direction for the flashing illumination of the room, that the dark period must be proportionally long at the beginning to make the after-image change.
- 5.) When it is possible to lengthen the light period while the negative after-image is maintained, the more favourable is the prognosis.



Technical Statements

A sideward sliding knob allows additional lenses to be inserted so that the illuminating ray emerges at an angle of 30° . This is of great importance for the amblyopia treatment detailed above; with the 2 covering spots extending over areas of 5° or 3° , or with the green filter which may be inserted as the examiner chooses. If the knob is in the down position a small, but very intensely illuminated field of 7° is present, especially apt for retinoscopy with reversed projection, used in conjunction with lenses of 13 DS or 15 DS. The sizes of the spots are $1,1^\circ$ and $0,7^\circ$. The compensation of the visual disturbance of both the examiner and the patient is provided by two combined discs "Rekoss" ranging from $+ 25,0$ up to $- 24,5$ DS graduated in 0,50 DS. In spite of this refined graduation the regulation can be achieved very quickly by a system of cog-wheels.

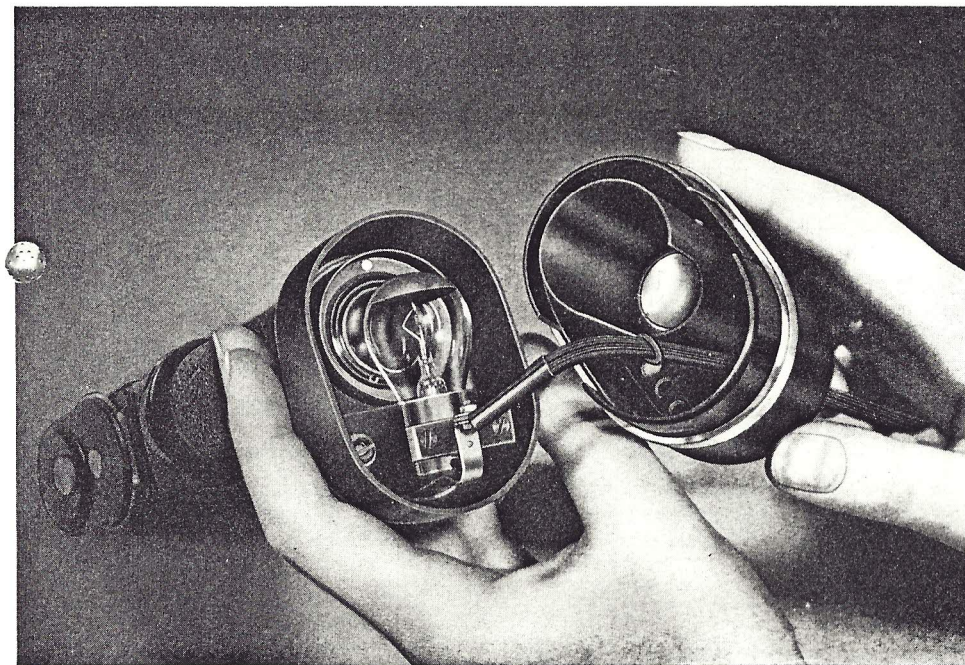
Even in cases of ametropia, the spots can be defined very sharp on the fundus as there is an additional "Rekoss" disc which allows a rough graduation at the side of the instrument where the ray emerges. This disc is used to regulate the refractive value which is already known from the measurement of the glasses, before beginning the treatment.

The light source of the instrument consists of a lamp "Osram" Nr. 7892, 6 volts, 15 watts. After removing the lamp box at the base the lamp can be taken out of its socket. The horizontal position of the lamp allows a shadowless illuminated field and gives the chance to insert a concave mirror by which the returning ray is also projected by a condenser to increase the intensity of the light.

After changing the lamps, it is easy to adjust the mirror with 3 screws at the bottom of the box. A white plane is put close to the instrument while illuminated, creating a small illuminated field and the two light marks are adjusted one on to the other by moving the screws.

For this purpose the two screws of the lamp base are loosened and the cover is taken off; the lamp while burning is adjusted until the picture of the light appears equally illuminated. Then the screws are fixed again.

In cases of alternating currents, a transformer with a secondary capacity of 15 W (6 V, 2,5 A) is required. If the bulbs are of a stronger capacity (25 W) the transformer must be of 6 V, 4 A. Please ask for the corresponding instruments in cases of direct currents.



Electrical Controller for Flashing

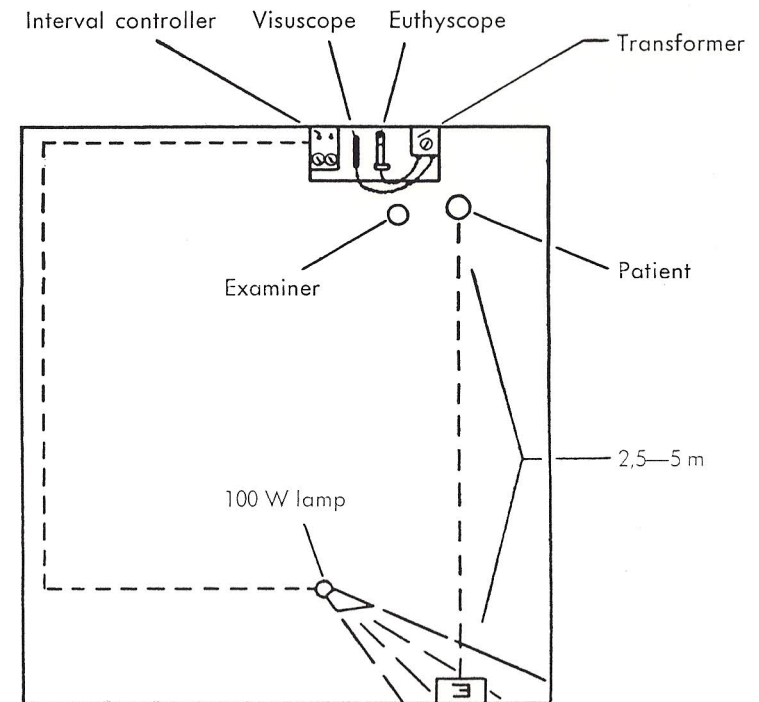
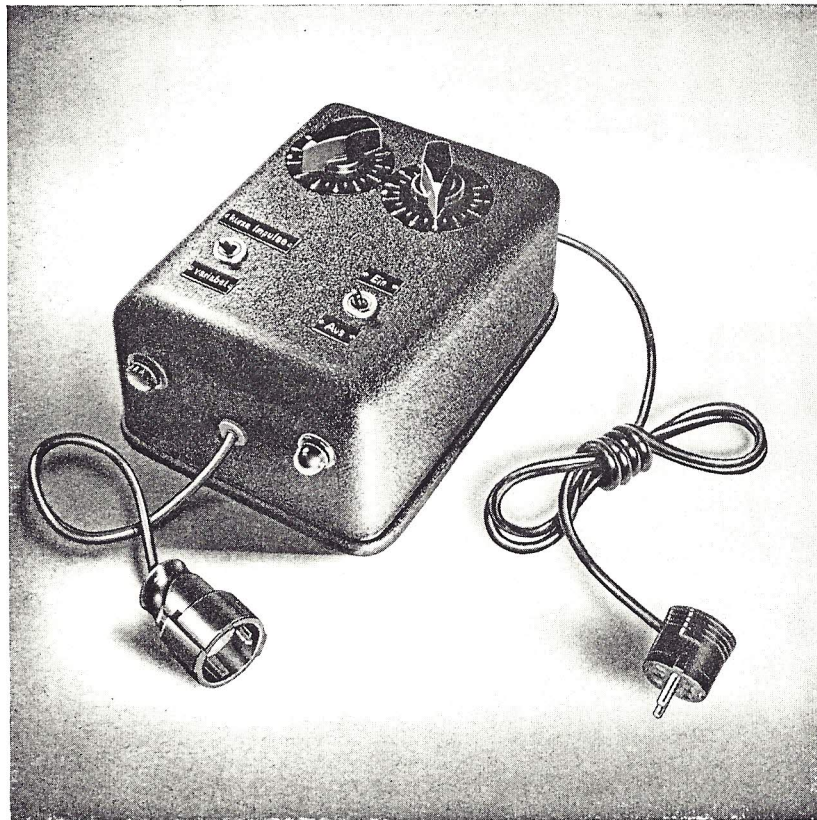
This instrument is placed in a box which contains a cable with connector socket which is to be supplied with a normal "Schuko" wall plug. On the opposite side is a cable with a "Schuko" clutch on which the fittings that produce the flashing in the room can be connected.

A normal desk lamp suits for this purpose. A movable reflector is to be placed in a manner so that it illuminates the wall opposite to the patient. Bulbs of 100 watts are recommended. The interval-controller has a circuit-breaker at its front side, and a safety mechanism of 0,8 A. On the top of the box are two dials by which both the light phase and the dark phase can be adjusted.



If the switch-key "On-Off" is placed in the position „On“, the interval controller starts up. Another switch brought to the position „short impulses“ adjusts to a quick frequency. If the switch is in the position "variable", is switched over to all adjustable dials.

The interval controller of the Synoptophore can not be used for the flickering of the illumination of the room because it is adjusted for a low Volt-tension and the other is adjusted for a normal voltage.



Proposal of accessories used with the Euthyscope:

Intervall controller (Please indicate voltage)

Transformer for Euthyscope and Visuscope, 6 V 2,5 A adjustable to 4—9 V

Chart with E-letters on paper

Pointer for children