Arch. Soc. amer. oftal. optom. (1959) - II - 313

Nuevos Instrumentos
News Instruments

THE PHORO-ACCOMMODOMETER AND OFFICE INSTRUMENT FOR ACCOMMODATION AND CONVERGENCE RESEARCH

BY
MERRIL J. ALLEN, O. D.
Bloomington, U. S. A.

At the present time are no available office testing equipment or proceedures that can measure the status of accommodation and the simultaneous status of convergence. This paper gives a discription of a simple instrument which combines the principles of a Badal and Scheiner optometer with a simple phorometer.

The prototype instrument, figure 1, has been in use for over three years and has proven its practicality for special accommodation and convergence studies on routine clinical patients. It has a 10.00 D. accommodative range and a convergence and divergence range of 30 D. These values have proven satisfactory for accur ately obtaining the ACA* ratio by menas of phoria measurements without instrument limitations in almost every case.

Figure 2 is a schematic of the optical system utilized in the phoro-accommodometer. A colimator and a Risley prism are mounted before the left eye and are used for measuring convergence. A Badal optometer seen through M by the right eye provides the stimulus to accommodation, and a vernier optometer seen by reflection at M permits the measurement of the accommodative response.

For the left eye, lens L_4 images the vertical filament S_3 at infinity. The Risley prism R, receives parallel light from the lens L_4 and changes its direction in proportion to the power set into the prism. Since the rays are parallel entering and leaving the prism, no interpupillary distance adjustment is necessary as long as the target can be seen within the field of the prism. The light source S_3 is a retinoscope "streak" bulb illuminated only for occasional very brief flashes so that the patient's left eye has no target for the mayority of the time and assumes its phoria position.

* The ACA ratio is the amount of convergence change induced by 1 diopter of accommodative change. A value of about 4 prism diopters/1 D. is considered to be the normal ACA ratio.

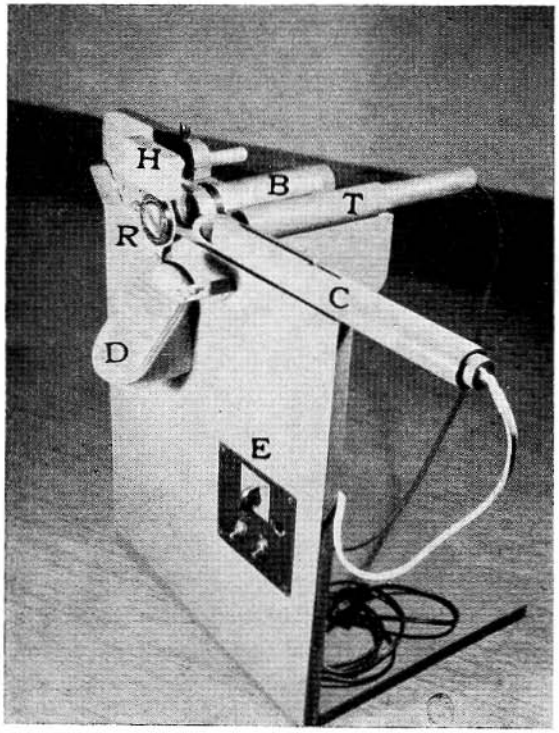

Fig. 1. The Phoro Accommodometer. The parts are as follows: H is an adjustable forehead rest; D is an inclined plane chin rest; R is the Risley prism before the left eye; B is the colimator housing which can be swung upward out of the view of the left eye; T is the target housing which can be swung to the right out of the view of the right eye; C is the housing of the vernier optometer; E is the electrical control panel (placed conveniently for the subject to operate during a special experiment); the base and upright are made of plywood; the metal piece causing a shadow between C and D is a hinged eye positioning device whose position in the photograph has no significance.

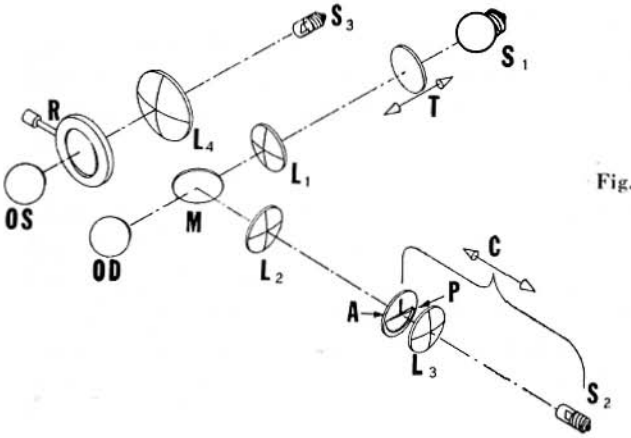

Fig. 2. The Optics of the phoro-accommodometer.

In front of the right eye is a beam splitting mirror, M. Beyond M at 10 cm. from the entrance pupil of the eye is L_1, a +10.00 diopter lens. Through lens L_1 the patient can see a reduced Snellen letter target, T, illuminated by the light source S_1.

When T is placed 10 cm. from L_1, the stimulus to accommodation is zero. T may be moved forwar or backward from this position and each centimeter of movement will produce a 1 diopter change in the stimulus to accommodation. Simultaneously the right eye receives light from L_2 reflected from the mirror M. L_2 is + 10.00 D. and is optically 10 cm. from the entrance pupil of the eye.

"A" is a metal disc with a .2 mm vertical slit about 1 cm long cut through it. Cemented to the back side of A is either a by-prism or a single prism as indicated on the figure by the letter P. Inmediately behind the slit and prism is lens L_3 which colimates the light from the retinoscope streak bulb S_2.

The assembly A through S_2, indicated by C on the diagram, is a vernier optometer which indicates zero diopters accommodative response when A is 10 cm from L_2. Each centimeter movement away from this point changes the amount of indicated accommodation by 1 diopter. Assembly C is used to measure the accommodation while the patient focuses on the target T seen through the mirror. The patient sees a letter target and also a fine vertical line (dis A) by reflection from M. If assembly C is adjusted to the conjugate focus of the right eye, the vertical line will appear to the patient to be a continuous line. C is not at the conjugate focus of the eye, the patient will see the upper half of the line displaced laterally from the ower half of the line.

Prism P. is a 2 prism diopter base horizontal and works satisfactorily when used as indicated in the diagram. (An optically superior system would be to use an upper 1 prism diopter base left and a lower prism of 1 prism diopter base right. The two prisms must be edged so that the dividing line between them is as thin as possible). The spacing between A and L_3 is not critical. The spacing between L_3 (+ 10.00 D.) and S_2 is 10 cm.

SUMMARY AND CONCLUSIONS

An office type research instrument called a phoroaccommodometer is described. It is a simple, inexpensive instrument with good accuracy for measuring the accommodative response to a stimulus, the accommodative amplitude, the ACA ratio, the effect of convergence on accommodation, instrument myopia, psychic accommodation, psychic convergence and etc.

It is a vernier optometer combined with a Badal optometer and a prism phorometer.

The prototype instrument is in the Division of Optometry and a second instrument is in the office of C. W. Morris. O. D., Fortf Wayne, Indiana.

Experience to date has shown the phoro-accommodometer to be practical means of applying the principles of research haploscopes in an office.

Bloomington, Indiana

Arch. Soc. amer. oftal. optom. (1959) - II - 317

TREPANO PARA LA QUERATOPLASTIA EN DOS PLANOS *

POR

JOSE I. BARRAQUER M., M. D.

Bogotá, Colombia

Para la práctica de la queratoplastia penetrante en dos planos tal como fue descrita por el autor en Corneal Grafts de B. W. Rycroft Pag. 98, hemos diseñado un nuevo modelo de trepano que se adapta a un mango corriente de trefina.

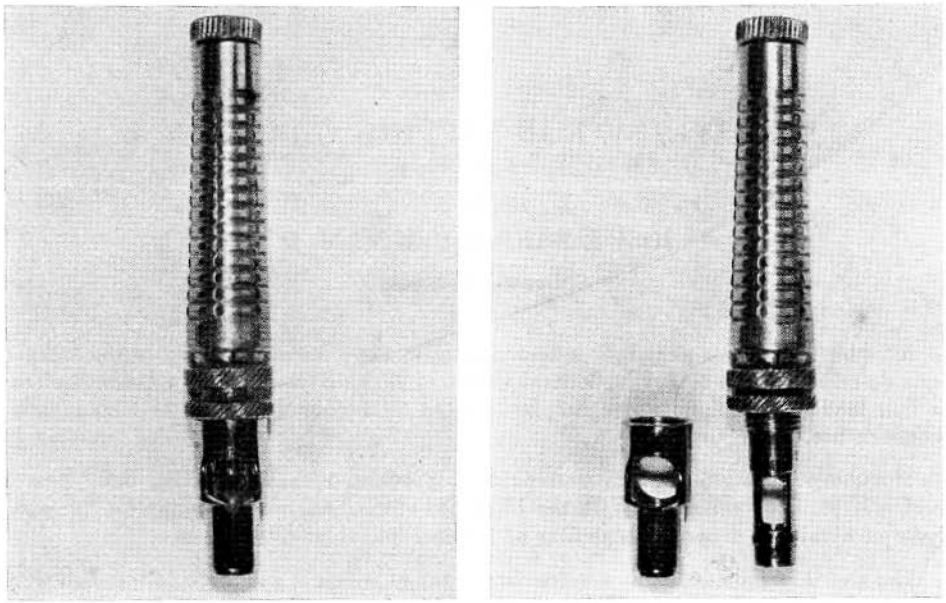

Fig. 1-2. Trépano para queratoplastia en dos planos.
Trephine for Steping Grafts.

* Construído por Moria, 108 Boulevard Saint-Germain, París.

El trepano interior de 5 milímetros cortante va provisto de una guarda exterior perfectamente concéntrica con el de 6½ milímetros no cortante para permitir el perfecto centraje de la incisión de los planos posteriores.

La guarda mediante una rosca puede deslizarse en sentido del eje del instrumento a fin de proteger el filo del trepano cuando éste está en reposo o de permitir que el filo sobresalga 3 o 4 décimas de milímetro en el momento de utilizarlo.

Este instrumento debe utilizarse conjuntamente con un trépano ordinario de 6½ milímetros con pistón interior.

Si bien, las anteriores son las dimensiones más corrientes puede construírse en las dimensiones que se deseen.

La diferencia entre la dimensión del trepano interior y la guía exterior debe ser de 1½milímetros para los tamaños pequeños y de 2 milímetros para las dimensiones mayores.

Hasta la fecha las dimensiones mayores que hemos empleado con esta técnica han sido de 6,1 milímetros para la sección de las capas posteriores y 8,1 milímetros para la sección de las capas anteriores.

TREPHINE FOR STEPING GRAFTS *

BY

JOSE I. BARRAQUER M., M. D.

Bogotá, Colombia

In order to perform penetrating keratoplasty in two planes according to the technique described by the author in Corneal Grafts of B. W. Rycroft p. 98, we have devised a new model of trephine which can be adapted to the handle of any of trephines in common use.

The sharp cutting 5 mm. inner trephine is provided with a protecting outer guard which is perfectly concentric with the blunt non-cutting 6½ mm. trephine for the purpose of obtaining a perfect centering of the incision of posterior planes.

The guard is provided with a screw by means of which it can slide in the direction of the axis of the instrument for the purpose of protecting the sharp edge of the trephine when this is at rest or else to allow this edge to protrude 3 o 4 tenths of a millimeter at the moment al which it is used.

* Made by Moria, 108 Boulevard Saint-Germain, Paris.

This instrument is to be used conjunctly with a 6½ mm. ordinary trephine with an inner piston.

Although the trephine here described is made by the said dimensions, it can be made of any other dimensions, at will.

The difference between the dimension of the inner trephine and that of the outer guard should be 1½ mm. for small sizes and 2 mm. for the larger sizes.

Up to the present time the greatest dimensions we have used with this technique have been 6.1 mm. for sectioning the posterior layers and 8.1 mm. for sectioning the anterior layers.

Apartado Aéreo 11056

Arch. Soc. amer. oftal. optom. (1959) - II - 321

NUEVA TIJERA PARA LA TALLA DEL COLGAJO EN LA OPERACION DE CATARATA *

POR

JOSE I. BARRAQUER M., M. D.

Bogotá, Colombia

Para llevar a cabo la incisión en la operación de la catarata en una forma regular y sin necesidad de retirar la tijera de los labios de la herida describí en los "Archivos de la Sociedad Americana de Oftalmología y Optometría" volumen I, pag. 183 una tijera acodada de láminas rectas que tenía la peculiaridad de tener un tope móvil entre sus ramas a fin de que durante la talla del colgajo corneal la

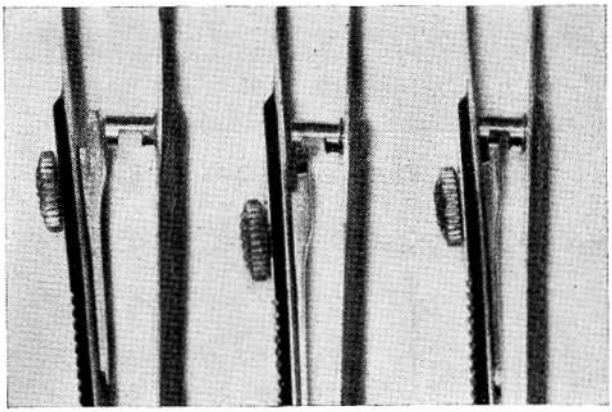

Fig. 1. A: Tope en posición para la talla del colgajo corneal.
Butt in position for cutting the corneal flapp.
B: Para la talla del colgajo conjuntival.
Butt in position for cutting the conjuntival flap.
C: Posición del tope para guardar la tijera cerrada.
Butt in position to queep de scissors closed.

* Este instrumento es construído por Moria, 108 Boulevard Saint-Germain, París, y E. Franz, Av. José Antonio P. de R., 562, Barcelona.

tijera no cerrase completamente y de esta forma poder tallar el colgajo en una forma continua sin retirar el instrumento.

El modelo que presento hoy tiene las mismas características pero se ha modificado la construcción mecánica del tope (fig. 1).

En la fig. 1-A podemos ver el tope en la posición requerida para la talla del colgajo corneal. En la fig. B la posición para la talla del colgajo conjuntival y en la fig. C para guardar la tijera cerrada.

La figura 2 muestra la tijera de perfil para apreciar la angulación de sus ramas y el dispositivo de tope. La tijera de frente abierta y en la misma posición cerrada.

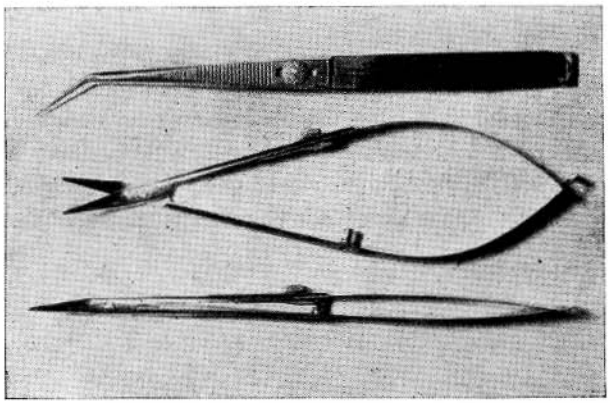

Fig. 2. Tijera para la talla del colgajo en la operación de catarata.

NEW SCISSORS FOR CUTTING THE FLAP IN CATARACT OPERATIONS *

BY

JOSE I. BARRAQUER M., M. D.

Bogotá, Colombia

To accomplish the cutting of a uniform incision in cataract operations, without the need of removing the scissors from th lips of the wound, I described in the "Archivos de la Sociedad Americana de Oftalmología y Optometría" Vol. I, p. 183, an angled scissor which have straight blades and a butt between its handle. This butt, which can be removed at will, prevents the scissors from closing completely at the point during the cutting of corneal flap. In this manner the incision for cutting the flap can be continued throughut its extent without removing the instrument.

The model herein described has exactly the same characteristics as those of the one previously described, but the mechanical construction of the butt has been modified (Fig. 1).

Fig. 1-A shows the butt in the position wich is required for the cutting of the corneal flap. Fig. B shows its position during actual cutting of the conjunctival flap and Fig. C shows the postion of the scissor when they are closed.

Fig. 2 shows the scisors in a profile position to permit appreciation of the degree of the angle of its blades and the mechanism of the butt. The scissors are shown from the front both open and closed.

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* This instrument is made by Moria, 108 Boulevard Saint-Germain, Paris, and by E. Franz, Av. José Antonio P. de R., 562, Barcelona, Spain.