is to say, that a certain type should be legible at a certain distance. More generally, however, instead of marking the distance they give approximately the number of the convex lens that is required if a certain line is the smallest that can be read, and this serves the purpose just as well. The lines are referred to as No. 1, No. 2, No. 3, etc., the smallest of all being No. 1. The type Nos. 1 to 9 on the hand card are in continuous graduation with the type Nos. 10 to 200 on the distance card.

When the distance test has been made, the near vision must be also tested by noting the nearest and furthest point of vision of the finest print on the reading card, both eyes being open. The V should be more comfortable at the natural reading distance than either further away or nearer.

The static refraction is that of the eye when at rest, that is not accommodated; it is, therefore, that of the refraction alone. The dynamic refraction is that of the accommodation when fully exerted. The two together constitute the maximum refraction.

Then the maximum refraction, less the static, is equal to the amplitude of accommodation.

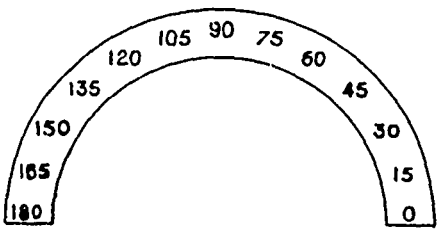

Fig. 31.

If the sight of an eye is = $\frac{20}{20}$, V is normal, but it does not of necessity follow that the eye is emmetropic, because accommodation might be exerted sufficiently to bring parallel rays to a focus at the retina. If V = $\frac{20}{20}$ without accommodation being exerted, then that eye is normal; so emmetropia may also be defined as the condition of an eye in which V = $\frac{20}{20}$, with accommodation suspended.

All testing must be done systematically: that is the grand secret of success. This order of making the tests and the determining of the various defects of V and their correction will be found in the following chapters.

Any deviation from the condition of emmetropia must be ametropia and this can be divided into primary and secondary.

Under primary ametropia are included only the errors of refraction, viz.:

H. Hyperopia, Far sight.
M. Myopia, Near sight,
As. Astigmatism, Mixed sight.

Anisometropia is the condition of refraction where that of the two eyes is different.

In correcting ametropia there are three things that are sought for by the competent optician, viz.:

(1) To make V normal, or as nearly so as possible.

(2) To bring the working point close to the natural distance.

(3) To restore harmony between accommodation and convergence.

V not being normal, the question arises, firstly, as to whether the abnormality be due to defective opacity of the media, defective nerve power, or defective refraction. This point can be decided conclusively by means of the pin-hole disc, which should be used always if there be any difficulty in determining the defect, or if there be doubt as to whether it be correctable by lenses at all.

All rays of light passing through a lens or the eye are refracted except the axial ray, and the nearer any others are to the axis the less they are refracted, while those far from the axis are the most refracted. It follows that where there is an error of refraction the more refracted rays must be further from a focus on the retina than those less refracted. Now, if there be an error of refraction, and V be defective, an improvement in sight must be obtained, on looking at the distant test card through the pin-hole. Nearly all the very refracted rays are blocked out, and only the axial ray, and a few surrounding it, are permitted to pass into the eye.

The disc must be put close to the eye,

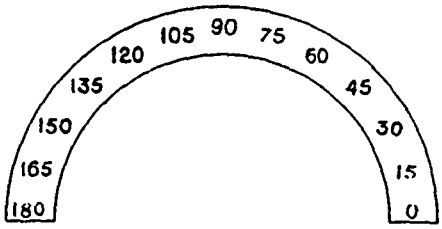

Fig. 31.

and used on one at a time. If V be better through the pin-hole disc than without, it is an error of refraction, and correctable by an optician. If the pin-hole shows no improvement it is certain that it is not an error of refraction, and it should, therefore, be immediately referred to an oculist or eye specialist.

This little instrument is very valuable in the hands of an optician, and it can be absolutely depended upon if properly used.

A proper testing frame should have carriers in each eye for at least three lenses, and it should be adjustable by means of ratchet work both for the P.D. (pupillary distance)—that is the distance between the two pupils—and for Ht. (height of the nose). It should also be adjustable at the sides and for the position of the nose-piece in and out. This adjustability brings the centres of the eye-pieces of the frame immediately in front of the pupils of the eyes and so into the best position for testing. If the trial frame be properly scaled, the measurements of the frame required can also be read off when making the prescription, although this is not the best method. (See chapter on frames.)

The frame is marked with the degrees from O. to 180, as in Fig. 31.

O commences in both eyes on the left of the patient, that is to the right of the optician when facing the patient or when looking at the front of the frame. Ninety is the vertical meridian, 180 is the horizontal.

The front part of the eye-pieces are generally made to revolve, and where the small scratch on a cylinder points to represents the meridian of the axis of that cylinder, this can be easily seen and noted.

A prescription form is as follows:

Date.

Mr.

Rx.

O.D.	O.S.
Sph.	Sph.
Cyl. Axis	Cyl. Axis
Prism Base	Prism Base
P.D.	Dis. of temples
Ht.	Width nose top
Sides	Width nose base
Nose piece	Bridge in—out
Style of frame	For reading distance
Size of eye	

Remarks

The particulars in the first column are always necessary; those in the second column only occasionally. More will be found concerning these matters in the chapter on frames.

Every optician should keep a record book with the above details, and, in addition, any particulars about the case, such as the visual acuteness before and after correction. The prescription form is what should be sent to the manufacturing optician or wholesale house with any order for special lenses, so that all requisite details be plainly given.

A sample sheet of an optician's ideal record book should contain:

No. of record—Date.
Name—Address.
Age.
V. of O.D. and O.S. before correction.
" " " after "
(with spaces for at least 3 tests).
The correction found.
The prismatic aid (if required).
The additional reading power (if required).
What lenses are given.
Particulars of frames.

Cod-Liver Oil from the Pacific Ocean.

A Tacoma company is being organized for the purpose of preparing and marketing cod-liver oil. The developing cod fisheries of the North Pacific Ocean and Behring Sea are highly favorable to the manufacture of this by-product, while the absence of hake, haddock, cusk, and other inferior fish add to the advantages as compared with the North Atlantic cod fisheries.—*West Coast Trade.*

CHLOROBROM.—A mixture of equal parts of chloralamide and potassium bromide. Used as a hypnotic, especially in the treatment of the insane.

PANGADUINE.—Name proposed for the collective alkaloids of cod-liver oil. A crystalline solid, soluble in alcohol and in a mixture of water and glycerin.