

Optics.

Presbyopia.

By G. N. LOCKEY (*Optical Journal*).

It is not my purpose to go into details to explain what presbyopia is, and the condition of the eye that causes it, as that is fully explained in any of the many text-books that every optician has or should possess. It matters not to us whence the name was derived, since it is here, and probably in about the same general condition as in ancient times.

The first authentic record dates back about sixteen hundred years prior to the Christian Era, where we read in Genesis that "Isaac's eyes grew dim with age." Presbyopia is very distinct from other troubles of the eye, since it is not a malformation, but a physiological change, that comes to all who arrive at the age of maturity, but usually not noticeable until it begins to interfere with our daily vocations.

The cause of presbyopia is easily explained; one text-book will tell you it is the rigidity of the crystalline lens, another, that it is a weakening of the ciliary muscles, and, another, that it may be either or both, so you see that point is easily settled.

Now, what effect does this have on the acuteness of vision? Simply none at all, as the vision is not impaired, and it is only when we try to use our accommodation, that we find we cannot see near objects, like fine print, as easily as formerly, then we begin to realize the approach of presbyopia. Convergence and accommodation are closely linked, and while convergence usually holds good through life, accommodation weakens at an early age, and the two no longer work together, but, thanks to the invention of glass, we have the only known remedy whereby harmony can be restored, and near vision brought in harmony with convergence. The mobility of the eyes in early years allows the several parts of the eye to work in harmony, and forty years must pass before we begin to strain the ciliary to obtain good vision; from then, through life, we can obtain near vision through the aid of glasses only. The proper strength of convex spherical lenses placed before the eyes gives us easy vision again, at the same time, the rays that pass out

of the eyes being convergent create an artificial myopia, with a certain far point of distinct vision, which necessitates the removal of the glasses when distant vision is required.

I find that whoever lives out of doors with a relaxed accommodation, in the majority, requires a stronger glass to cover the presbyopia than one of like age whose business is close work the larger part of the time, as the muscles are set (so to speak) and does not take as strong glass to bring the vision to the same reading point. Many people who require glasses for presbyopia will postpone their use too long and think that they may get along without them. And after standing them as long as possible will apply for a correction. Such people often have strained muscles and perhaps spasmodic conditions, which must be taken in consideration when we prescribe for them as the glasses given them would not be the same as if the eyes were relaxed. I never use a lens of over + 2.50 D. and if I find they test higher than that I look for something else and usually find it.

My method of fitting presbyopia is to make all corrections (if any) first leaving all lenses in the trial frame. Then if the age be about 50 I put say a + 1 D. sphere before each eye and after centering the lenses with the pupil of the eye find far and near points with print suitable for the distance. I hold the print outside the far point gradually advancing, asking in the meantime to tell me when it clears up with well-defined edges and no blur to it. At that point I note the distance, then holding it a foot or so from the finest print and note it. Then let them take a common newspaper and watch where they hold it for easiest vision. Now with these three positions before me it is not hard to judge if the lenses before the eyes are too strong, too weak or just right. A person who uses his eyes but little for near work will hold the paper relatively nearer the far point than one who is working mostly at near work and will get the easiest vision at that point for reading. Of course I inquire if they are wanted for reading, if so I advise 14 inches as the proper distance for a medium-sized person. But if they are required for desk work, or the pulpit,

or to work at arm's length then I prescribe for distance needed, always explaining that only at one point is best vision found for a presbyope wearing glasses. I have frequently prescribed two pairs for one person for reading at 14 inches and for carpenter work or blacksmithing at 24 inches, and find satisfaction given when explained to them.

It would seem that presbyopia would require much less study than the malformations do for its correction, but, as it is the finishing touch for good reading vision to all who are past 40, it should be done with judgment and care to satisfy the customer. A large class of middle-aged and older people are satisfied when they can read easily even if their distant vision be impaired with hyperopia or myopia. A slow and steady recession of the near point is a natural condition and people ignorant of the fact that it advances should be informed that nothing but a change of glasses, say once in about two years, will cover the difficulty and will give them the best attainable vision. I know of no modern appliance for testing the eye for presbyopia to equal the trial frame and convex lenses in their fractions up to 3 D. Of course it is understood that their means uncomplicated presbyopia when errors of refraction are present, or muscular difficulty, they are taken care of in their turn.

Preparation of Carbolic Acid in Powder

When boric acid is heated at 300° C. it parts with successive molecules of water and becomes converted into metaboric acid, then into pyroboric acid, and finally into boric anhydride, a colorless vitreous mass, which returns to its original condition of boric acid on solution in water.

F. Lutze utilizes this behavior of boric acid in his process (patented in France) for making dry carbolic acid by adding to the fused boric acid crystallized carbolic acid, continuing the application of heat to the mixture and allowing the latter to crystallize out and dry at the ordinary temperature. The product, which can be readily reduced to powder, no longer exhibits the hygroscopic properties of the crystallized carbolic acid but remains dry. This result is obtained in a more or less complete manner by small as well as large quantities of boric acid, so that a dry carbolic acid containing more or less boric acid can be produced.—*Oils, Colors and Drysalines.*