NEW OPTOMETRY

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Yes, make it easy for yourself. It can be done. And the new Optometry can jibe with the old.

Today, after several years of clinics, lectures and talks on "New Optometry" or "Analytical Optometry," or "21-Point Optometry," there are those to whom a question addressed on the above subjects has practically the same effect as someone jumping out of a dark closet and shouting "Boo!"

There are men who are actually doing the new routine every day but who do not grasp the fundamentals of the new theory. This state of affairs is decidedly not as it should be, and it would seem that there has been too much attention given to the intricate technicalities of analytical work and not enough attention to the fundamental differences between the good old-fashioned optometry and the new.

A football team may be highly trained on fancy trick-plays and yet lose the game, due to lack of knowledge of the fundamentals of blocking and tackling. So for our purpose we are going to forget all about such things as meter-angles, prism diopters, lags, refractive indexes and abberations, as well as all the other minutiæ, pertaining to physiological optics. And most of all, we are going to forget that good old illustration which has appeared in every optical book from year to year. (See chart No. 1.)

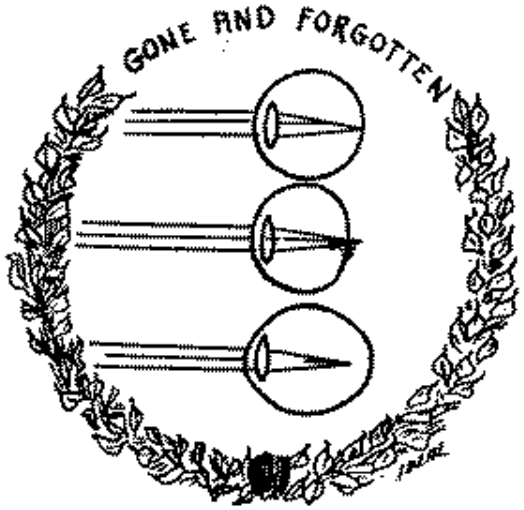

CHART I

Here is why. For many years Optometry has been taught on a purely mechanical or physiological basis —the-eye-is-like-a-camera theory. The image on the screen is blurred. You apply plus or minus, clear the image up and, presto! the glasses are fitted. A hyperopic eye was "too short." A myopic eye was "too long." An emmetropic eye was just right.

Some books on optics gave even the measurements of eyeballs that had been removed from the socket, showing the increase in posterior-anterior length in millimeters in comparison with the amount of myopia which had been present. Myopic eyes were supposed to be large and "poppy"; hyperopic eyes, invariably small and "buried."

This long-and-short eyeball theory has served us long and faithfully to the best of its ability for many a year (still Chart No. 1) and, besides, always looked well on a blackboard. Therefore, before we think of casting it aside, let us first examine it for major faults. Are you ready?

If a myopic eyeball is actually too long, what happens when the amount of myopia increases or decreases? Does the eyeball stretch in one case and shrink in the other? It doesn't seem right, does it? And yet out of your own experience you have seen myopia increase, and perhaps you are one of those men who succeed in reducing myopia by proper handling.

If a hyperopic eye is actually too short, what happens when the amount of hyperopia increases or decreases? Does the eyeball become shorter in one case and longer in the other? Again it does not seem right, does it? And yet we know that hyperopia *will* increase or decrease.

Here then, in myopia and hyperopia, we have two very common conditions that are highly variable. And yet the eyeball itself is a very tough and leathery member and not easily given to changing its shape.

We know right along that there was more

MAKING IT EASY FOR YOURSELF

to fitting a pair of glasses to a pair of living eyes than merely putting them in focus, as we would a camera. And yet for lack of a better basis we kept right on using Chart No. 1 to explain optometry to ourselves and to the public.

And so now, if you agree with me that the old "eye-is-like-a-camera-long-and-short-eyeball" theory is unsatisfactory, we are ready to take the jump into New Optometry.

II

New optometry says, briefly, that there are no "too long" or "too short" eyeballs. Nor is there an eye that sees perfectly at a distance in a state of "rest."

Instead, it tells us that the accommodative function is over-energized, under-energized, or energized just right! And, furthermore, it gives us a workable theory with which the various types of cases can be reasoned out.

We deal in innervations and end-results, instead of diopters and meter-angles! We deal with a pair of brain centers known as accommodation and convergence (or adduction), which are supposed to work harmoniously together—and when they do not work harmoniously somebody comes to you for eye-comfort.

For our purpose these brain centers may be likened to a pair of storage batteries. One operates the accommodative function and the other operates the convergence or adductive function. The nerves leading to convergence muscles and the ciliary become electric wires, the nerve force is electricity, and the convergence muscles and the ciliary themselves become devices actuated by the impulse received from the brain-center storage batteries. Does this sound complicated? Not at all.

Look at Chart No. 2 which shows a comfortable or emmetropic pair of eyes at rest and also in various stages of activity. The thing to notice especially is that the accommodative battery and the adductive battery

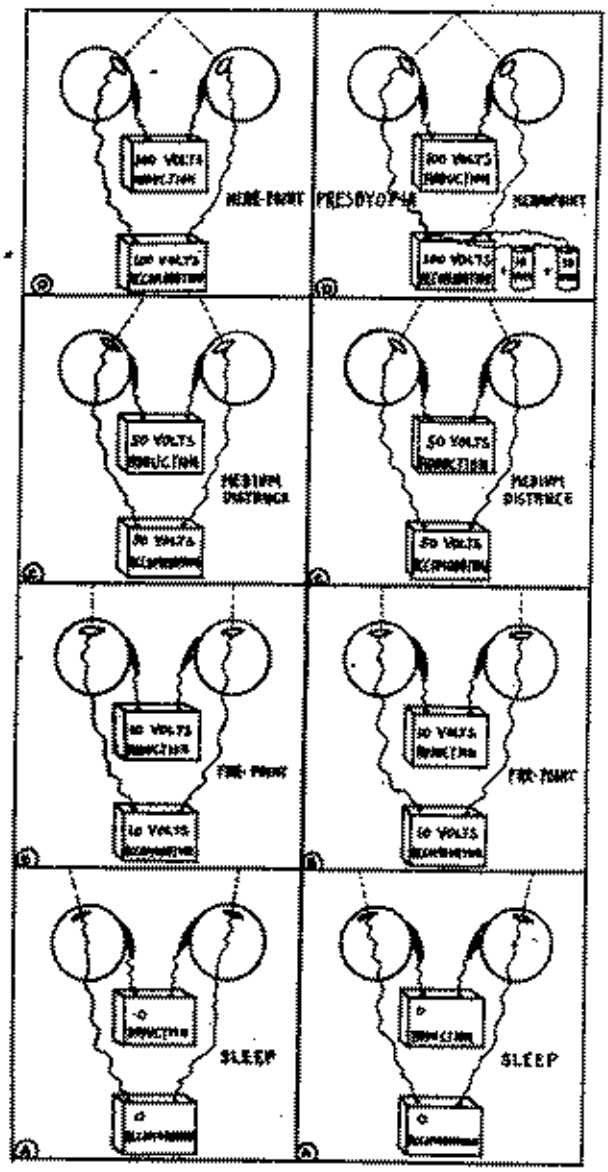

CHART II CHART III

are sending out equal amounts of nerve force, electricity, at all the various stages of stimulation. Never mind about the diopeters or meter angles involved. This chart represents a completely comfortable pair of eyes.

This matching of power, or teamwork, between the accommodative brain "battery" and the adductive brain "battery" has been called "the habitually associated accommodative-adductive relationship" (Skeffington).

The lower section (A) shows this pair of eyes really at rest. It is necessary to be asleep or unconscious to have a pair of eyes

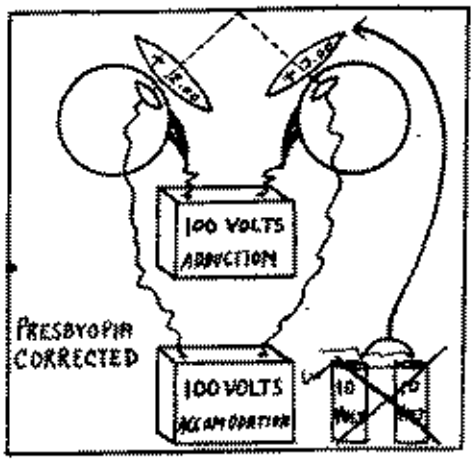

CHART IV

that are utilizing no energy at all. In such a case, the eyeballs assume a slightly divergent position, as shown, and the crystalline becomes slightly more flattened out than when actively seeing. The batteries are marked zero, indicating no energy being sent out over the nerves to their respective functions.

Section B shows the activity of the accommodative and adductive brain centers which takes place when this pair of eyes assume conscious brain binocular seeing. The convergence pulls the eyes into line and the crystalline assumes enough curvature properly to focus a distant image. Each brain center sends "10 volts" of energy to its respective function. Why is 10-volts sent to each function? It's a habit! It's just like you know in advance just how much of a twist to give the wheel of your car when turning a corner. Very early in life the accommodative center or "battery" discovered that 10 volts was just enough to focus the crystalline for distance; at the same time, the adductive center discovered that 10 volts was just enough to do the trick of holding the eyes parallel for distant seeing.

The 10 volts of accommodative energy *learned to become associated* with 10 volts of adductive energy. Again we point out that this is what Skeffington calls the "habitually associated accommodative-adductive relationship."

Section C of this same chart shows the increased, *but still equal*, amounts of energy being sent to the two functions at a medium distance. We have marked this 50 volts.

Section D shows the still greater, *but still equal*, amounts of energy being sent to the two functions at near-point. We are calling this 100 volts.

These brain centers or batteries care nothing about diopters or meter-angles. They are interested only in sending just enough energy to do the trick. And they become habituated not only in sending just enough energy but also in "matching" each other at the various stages of stimulation. This is the heart of the theory underlying New Optometry. So long as this habit of associated amounts of energy is undisturbed there is no discomfort and no need for your services.

So far, so good. We have a very admirable theory, if it can be applied to actual cases that come under our observation. Let us see if it can be applied to one of the most common cases that come to us for attention, Presbyopia.

III

Your patient, a man of 45, comes in with the usual story that he can see just fine out on the street but he has to hold his paper "way out like this" and, furthermore, his eyes smart and burn when he attempts to read.

Chart No. 3 illustrates this presbyopic case. You will observe that this is exactly the same as Chart No. 2 until we come to the last section (D), showing these eyes occupied at near-point. Observe that the convergence still functions properly on its habitual 100 volts of energy at near-point. However, the accommodative center has had to call in *outside* help in its attempt to make that aged and stiffened crystalline respond as of yore. We have attached a couple of dry cells to the accommodative battery to illustrate this outside help.

Here we have a condition where the amount of energy that the accommodative center has been *in the habit* of associating with a like amount of adductive energy, *no longer is sufficient* to focus the lens at near-point. The accommodative center is calling on an extra amount of energy "outside the habitually associated accommodative-adductive relationship." Hence, discomfort at near-point.

What do we do about it? That's easy. We do exactly what we have always done—fit plus lenses at near-point. This eliminates the need for the outside help (Chart No. 4) and the

(*Continued on page 36*)

New Optometry; Making It Easy for Yourself

(Concluded from page 16)

patient goes away happy. His accommodative and adductive functions are again working in innervational harmony.

In conclusion, it should be borne in mind that this article is written for the man who is having difficulty in making his post-graduate work fit in with his previous conceptions of optometry. The new books and courses now offered are based on the theory outlined here. It should be understood that no attempt is made here to take into account certain of the finer points or the invariable exceptions to all rules.

In a later article, we shall attempt to discover whether our "brain battery" diagram will work on other types of cases.

Significance of "Treat"—California Attorney General's Confusing Opinion

(Concluded from page 28)

in the prescribing, adaptations and supplying of lenses, when the glasses will aid the eye, or any part thereof. It seems to follow logically that in the adaptation of lenses to the eye, the optometrist will have a perfect right to follow optometric methods. when they are indicated, in order that such adaptation may give the best results, for orthoptic exercises in many instances, of course, are a highly efficient method of achieving exactly this end.

As to the second question asked by the medical secretary-treasurer, the Deputy Attorney-General, after analyzing the several sentences and clauses in Section 2 of the optometry law, wrote:

"From this it would appear that optometrists are not limited to the mechanical correction of vision, but may employ any means not involving the use of drugs to do these things above enumerated. If a mechanical means is the sole means, except by the means of drugs, whereby the powers of the eye or the range of human vision may be measured, then optometry would necessarily be confined to such field, but it is to be noted that the act does not require the express use of mechanical methods."

THE JOURNAL-REVIEW report from California indicates that the optometrists there are confident that there will be no real interference with their right to use prisms and orthoptic exercises as in the past.