Mirror Technique of Vision Training

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This technique, in so far as I know, is original and so simple that I am sure any of you might have thought of it, too. It is very obvious when you look at it and I am sure that when I have shown it to you, you will wonder why we didn't think of it before.

Since it is simple you will enjoy using it but likewise, since it is simple, you might in some measure overlook its importance or abuse it as a technique.

For instance, the motivation factor is an important one, for if motivation is not sufficient, the patient will not attend to the subject material and will get very little, if any result.

The testing ceramic (see illustration), is my old friend Zig, who has been all over the country with me. At one of my lectures I heard a grumble from one of the men as he came out of the lecture room, "I wish she wouldn't talk so much over our heads. I don't know what part of the visual mechanism a ceramic is."

Now Zig is a very fascinating fellow and will tell you a great many things. I use him as a testing animal.

The training animal ("Zag") (see illustration) resembles the testing animal ("Zig") very little, as he is of different size and contour and is striped differently, all for the purpose of being more readily perceived with accuracy than is the testing ceramic.

I have been deeply concerned with the manner in which individuals intrepret from disparate points in space. This facility and the lack of it is reflected in the quantity and quality of the patients blur point findings. If his (19) positive amplitude and (20) positive relative amplitude findings are high he prefers to interpret from disparate points toward near, if at all, and very often his tendency is to prefer to interpret from corresponding points on/or near the horopter plane for any point of fixation in his space world. If he interprets only from points on or near the horoptor (with horoptor defined as that plane of single binocular vision for any point of fixation in space), he is tending to interpret from corresponding points. It is only when he is able to interpret to any extent in the positive and/or negative directions off the horoptor that he is interpreting from disparate points in space, for any point of fixation in his space world.

Therefore, he is often very inept at the skill of interpreting in either the positive or the negative directions from the horoptor plane so that he distorts his interpretation of distance, form, contour and color beyond his far point.

Now the responses obtained when using "Zig" as a testing animal prove to be very interesting indeed. For instance, the myope, particularly, does not like to see in three dimensions. He avoids accurate interpretation from disparate points and prefers to interpret near the horoptor plane. Therefore, he endeavors to structure his field so as to organize solids into a plane. If you were to interpret his positive and negative relative amplitude findings, with this particular thought in mind, I am sure that you would see that he has this preference.

Since he endeavors to see in a plane rather than in a three-dimensional manner, he must be tending to accept interpretation from corresponding points on the horoptor and rejecting accurate interpretation from disparate points in space. The positive relative amplitude finding must consequently be much higher than the negative relative amplitude. The positive relative accommodative finding is the measure of the manner in which he interprets from disparate points toward himself and the negative relative accommodative finding is the measure of the manner in which he interprets from disparate points away from himself in visual space, for each point of fixation in space. Such a comparatively high positive relative accomodative finding would indicate that he had better facility for interpreting from disparate points toward near than toward far point.

It should be obvious that if he is to see a solid in accurate proportions in his space world, he must interpret from disparate points accurately. Since the myope does not tend to interpret accurately from disparate points, when he looks at Zig he might see anything but what he should see if he were not myopic. He does all sorts of things to Zig, with his visual interpretation. He pulls him all out of shape as though he were made of rubber or something very pliable rather than porcelain and in definitely solid form.

Therefore, if the testing ceramic, or Zig, is presented to a myope posterior end first, he may tell you that the stripes running vertically in the mid-section are blacker (see illustration of testing ceramic). Another myope, when presented with the same situation may tell you that the stripes running horizontally on the posterior portion are blacker. Still another myope may tell you that the stripes running horizontally on the anterior section are blacker. Then, if you will refer to your 20 and 21 findings (the positive and negative rela-

*This material is part of a lecture given at the San Jose Workshop, May 30-June 1, 1946

tive amplitude measurements), you may get a clue as to why each myope gives you his particular answer.

Many myopes prefer the mid-section of Zig on which the stripes are painted vertically. If Zig is presented to some patients, with the posterior portion first or toward him, he may tell you that this posterior section toward him is smaller, in order to shove it into the mid-section. Conversely, he may tell you that the anterior portion or head end is larger, since

Zig, Testing Animal

he tends to pull it into the mid-section toward him. Therefore, by making the posterior portion seem smaller and the anterior portion seem larger, that myope is able to organize Zig into something resembling a plane, rather than a three-dimensional figure or solid.

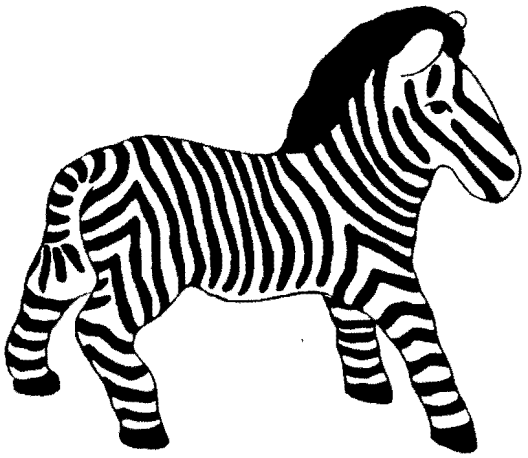
If Zig is presented to him with either end first, he will take the ceramic in his hands and turn it so that one side or the other is parallel to himself, as he prefers that view to the end-to-end view. The preference for this position does not require of him to accommodate for the entire length of the animal and does permit him to accommodate for the width of it, thus allowing him to see it almost entirely in one plane or like a paper cut-out rather than like a solid.

The particular patient described above will be found to have the exceptionally high 20, (positive relative amplitude) and exceptionally high number 19 (positive amplitude) finding. This, of course, indicates that his positive relative accommodative findings are high and that his negative relative accommodative findings are low, indicating that he would rather project toward himself than away from himself even at near point. Therefore, until we have balanced his 20 and 21 findings or his positive and negative relative accommodative findings, we will be unable to take an accurate 14A (unfused cross cylinder finding at near) or essentially change the number 4 (static retinoscope) finding.

This is true not only of the myope, but of any case, so it is well to give this factor consideration at all times when giving vision training.

We have said that the myope tends to reject interpretation in both the positive and negative directions from the horoptor surface. Consequently, when an attempt is made to measure his positive and negative relative accomodative findings on letters from a flat surface, he may substitute a change in the size of the letters instead of a change in the distance of projection before he reports a blur. Hence, he may elect to project a smaller letter through minus, which he may interpret to be farther away. Such interpretation is the reverse of the expected since the individual should interpret, through the *minus* lenses, as though the object had been *toward* the observer in visual space. Therefore, if he interprets the letter as smaller and farther away from himself (as the observer), you may have actually measured his negative relative accommodation with minus lenses rather than his positive relative accommodation as you had intended.

Another myope may elect to interpret, through a minus lens, a larger image which he believes to be nearer before he interprets a blur. Since he has substituted size for a portion of the distance in his interpretation, this may affect the *quantity* of the finding,



Zag, Training Animal

whereas if he projects away from himself rather than toward himself, through the minus lenses, it may affect the *quality* of the finding.

Conversely, when making an attempt to

parate points in space so that he might interpret from disparate points in a stereograph. If a stereograph were to be used as a training device, a stereograph was necessary, also, for a testing device. It was necessary, to have a stereograph, that when used as a test, would indicate whether or not the patient was interpreting from disparate points in both positive and negative directions from the horoptor plane. In casting about for such a medium, I found that the BU 21 stereograph was very appropriate. As you will note, it is a picture of a mountain in the background with cables running from background to foreground, with a cable car suspended from the cables in the foreground and to the left. A circle and a cross are drawn in this referential background. The cross is drawn at corresponding points within the stereograph so that it should be localized in the extreme background on the mountain. The circle is drawn at non-corresponding points in the foreground, so that it should be localized toward the foreground.

Therefore, the expected response for this test, is that the circle should be projected somewhere in the region of the tram car and the cross should be seen through the circle and localized as though it were on the mountain. Such a response would indicate that the patient were interpreting accurately from disparate points in space. The examples of some of the various ways in which BU 21 can be interpreted will indicate to you the manner in which the individual is interpreting from disparate points in his space world.

Some myopic patients see neither a stereoscopic figure nor a stereoscopic ground in three-dimensional fashion. They interpret the background as flat and see it in perspective rather than in three-dimensional form. Likewise, they project the circle outside the schema toward themselves and place the cross within the circle and, therefore, in the same plane as the circle. Hence, they see the cross *in* the circle rather than *through* it, indicating that the tendency is to interpret on or near the horoptor, and from corresponding points, rather than from disparate points or points in the positive (toward the observer) or negative (away from the observer) off the horoptor plane.

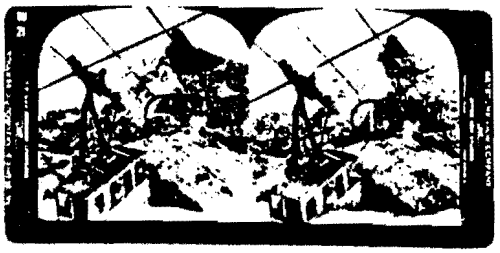
There are other patients who will see the background as flat, or in perspective, but who will see the circle in front of the picture and the cross somewhere behind the circle, but not associated with the picture. Such a response indicates that he is seeing a stereoscopic figure and a flat ground.

Then, there is the patient who does not project the cross as it is drawn but places it somewhere between the circle and the mountain. He associates both the circle and the cross with the picture but still tends to separate the stereoscopic figure from the stereoscopic ground. He is interpreting from disparate points in the foreground but not in the extreme background of the stereometric schema.

The patient is questioned for this test in the following manner:

1. Do you see a circle and a cross?
2. Where is the circle? Is it inside the scene or out of the scene toward you?
3. Where is the cross? Is it in *front* of the circle, *in* the circle or *behind* the circle?
4. If it is behind the circle, how far?

If you will interpret the patient's response to this skill test in the light of your positive and negative relative accommodative findings



Keystone BU 21 Stereograph

you will find an interesting comparison. You will find that the greater the tendency to separate the stereoscopic figure from the stereoscopic ground, the higher the positive finding will be in relationship to the negative finding. You may be surprised to note that when the selection of the figure is complete and the ground is practically excluded, he will see the figures in the same plane and the ground in perspective rather than in stereoscopic form during the BU 21 test. In such an instance, of course, the positive amplitude and the positive relative amplitude findings are extremely high when taken to blur, and not to change in image size. His response will also tell you at approximately what distance in his space world he has rejected interpretation from disparate points and whether the rejection is partial or complete.

Caution! Be careful in giving the BU 21 test to mention *no portion of the referential background* to the patient when asking for the position of the circle and cross, for if you do, you give him a clue as to the expected association between figure and ground thereby rendering your test invalid.

Now since I had located a test to determine the manner in which the patient interpreted from disparate points on a stereograph, I was ready to discover a technique for training the patient *in his space world* so that he would subsequently be able to interpret more or less accurately from disparate points in a stereoscopic training situation.

Bank of America Building

(To be concluded next week)

measure the negative relative accommodative with plus lenses, to blur on letters from a flat surface, he may interpret, through the plus lenses, a larger image which he interprets as being nearer. Such interpretation is the reverse of the expected since the eyes should posture, through the plus lenses, as though the object were moved away in visual space, instead of toward the observer. Thus, in this instance, the quality of the finding is altered since we are actually measuring his positive relative accommodation through plus lenses instead of the negative. Another myope may elect to interpret a smaller image through plus lenses before he reports a blur. Since he substitutes a smaller image for a portion of the distance and as being further away, the report indicates that the finding is higher than it would be had he not interpreted a change in size and that therefore the quantity of the finding is affected.

It is well to note, therefore, where the image changes size through both plus and minus lenses, since a variation in the interpretation of size is substituted for an interpretation of distance. Both the quantity and quality of the finding may then be affected. Since the card, or the flat surface on which the letters are placed is in the plane of the horoptor during the test, the myopic patient is in difficulty because of his lack of facility for interpreting accurately in either the positive or negative directions from the horoptor plane. The expected interpretation through plus and minus lenses is for a change of distance in visual space. Consequently, in substituting a change in size for a change of distance, the patient indicates his preference for projecting in either the positive or negative directions from the horoptor surface and/or his preference in rejecting projection in both directions from the horoptor plane.

We do not expect to get accurate near-point findings in the case of the squinter because he lacks facility in the function of convergence or binocular fixation. Conversely, we should not expect to get accurate findings in the case of a myope for he lacks facility in the function of focus or accommodation for accurate interpretation of his space world. So until the squinter learns facility in the function of fixation, accurate findings are impossible to obtain. Likewise, until the myope learns greater facility in the function of accommodation, accurate findings are impossible to obtain. The finding may be considered as the expected when there is no change in size as a substitute for distance before the patient reports a blur.

Now let us remove the patient's lenses and go back to our friend Zig as a testing ceramic. If the patient, when fixating for Zig placed in the field posterior portion toward the patient sees the lines in the central portion of Zig as blacker, that patient prefers to fixate on the mid-section, and since then his horoptor runs through the mid-section of Zig, he is indicating his preference for interpretation from corresponding points. If however, he prefers the portion of Zig away from himself, and beyond the mid-section, or just that protion of Zig nearest himself, these responses will tell you whether he prefers interpretation from disparate points *toward* or *away* from himself.

If you have recorded changes in image size as well as your blur point in your positive and negative relative amplitude findings, you will find that they correspond to the manner in which Zig has been described to you. If he prefers the near portion of Zig your positive finding will be high when taken to change in image size. If he prefers that portion of Zig furthest from himself the positive finding will be low when taken to change in image size. If, on the other hand, he prefers the mid-section of Zig to either the anterior or posterior portion, you will find an exceptionally high positive relative accommodative finding, revealing that he definitely prefers interpretation from a plane or the horoptor surface. Also, you will find the positive finding, as based on blur point, is the *entire measure* of how far he projects *toward* himself through the minus lenses until the image changed size and then how far he projects *away* from himself, interpreting a smaller letter until it was so small it squeezed out into nothing rather than becoming blurred, and is therefore the measure of *both* the *positive* and *negative* relative amplitude as measured with *minus* lenses.

Since these were his reactions to a *testing* situation on a *flat surface* it occurred to me that there should be some way to change the (20 and 21 findings), positive and negative relative amplitude findings, but that since the myope prefers to see a ceramic broadside rather than end-for-end and prefers to see in or near a plane anyway, little could be accomplished by *training* him on print on a flat surface to relieve a patient of that type of myopia.

From the foregoing observations, it should be obvious that since the patient is unable to interpret from disparate points in space without distorting his interpretation of his space world, he would not be able to interpret accurately from a stereograph. Accurate interpretation of a stereograph is obviously dependent upon the patient's facility for interpretation from disparate points (or points off the horoptor plane) which give the illusion of depth or three-dimensional seeing. I learned, therefore, that it was practically impossible to train such patients originally in a stereoscopic schema.

Stereographs, of course, were my first love. I realized that if I was to use a stereograph as an integral part of the training routine, I must find some way of teaching the patient to interpret more or less accurately from dis-

Mirror Technique of Vision Training*

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(Continued from September 12 issue of THE OPTOMETRIC WEEKLY)

I have developed the three-way mirror technique for the purpose of teaching the patient to interpret from disparate points. The three-way mirror is composed of a center mirror 12 inches wide and at least 16 inches high. The dimensions for the wings on either side of the mid-section can be 10 to 12 inches wide and at least 16 inches high. The wings of the mirror must be (on the bottom) shorter than the center section so that they swing freely on their hinges. The three-way mirror is mounted on a mirrored base 36 inches long, or as long as the sum of the width of the center section plus the width of the two wings. (See illustration.)

Place the ceramic in the mirrored field as illustrated and ask the patient to describe what he sees and how he sees the ceramic. After he has completely described the original have him describe the mirrored image of the original.

It is the most difficult part of the entire training procedure to get these descriptions. The patient is prone to tell you simply that the original looks "all right." Certainly it looks "all right," for there is no way in which he may discern a contrast. It is his impression, and so how would he know? That is the way the world looks to him, and furthermore, he may prefer to have the world look that way. He may have elected to see near the horoptor plane or to distort the image rather than to exhibit accurate interpretation for contour. Therefore, the practitioner must not offend his patient in getting a description of the individual's interpretation of his space world. He must have patience, and with adroitness and tact, extract the patient's impression of his space world and encourage him to give that impression by creating the idea that he, as the practitioner, is not concerned with *reality* but is definitely concerned with *that* individual's *interpretations* and *impressions*.

It is more satisfactory to obtain the patient's interpretation of the ceramic before he has been allowed to touch it with his hands. We are concerned with his visual interpretation, originally, exclusive of his tactile impressions. I regret that there is neither time nor space in this report to go into the phase of getting the patient's impressions of what he sees. For the moment I shall have to concern myself with the *mechanics*, rather than the *phychology* of mirror training. In a later lecture, or article, I shall endeavor to give the psychological point of view for getting an adequate response to mirror training. This is simply the mechanistic approach.

After the patient has described both the original and the image and his responses have been recorded, you may proceed to mirror training. The training ceramic, Zag, is then substituted for the testing ceramic.

The right eye is trained first, with the ceramic reflected in the right wing or field, and the patient uses the hand not engaged in moving the wing of the mirror for occluding the left eye.

Instruct the patient to move the mirror from approximately a 45 degree angle with the center mirror toward the ceramic until the wing of the mirror almost touches Zig. This is called the "in stroke" of the mirror. The patient is instructed to keep his eyes open during the "in stroke" and to keep his eyes closed as the mirror is moved back to the 45 degree angle position.

The patient is asked to look from the image to the original, as if bombarding the image and the original in turn, in ping pong fashion. He is asked to encompass the *whole* form of either the image or the original as the mirror is moved toward the ceramic. Since the ceramic is headed into the corner formed by the center mirror and the wing, the patient must needs accommodate for the full length of Zag, for both the image and the original, as he changes fixation from the image to the original and back again. It is *suggested* (by asking that he endeavor to make the image and the original "look alike"), rather than *requested* that the patient try to interpret the image as the same size and in the same form as the original. In this manner he learns in a very short time to improve the appearance of *both* the original and the image, until the

*This material is part of a lecture given at the San Jose, California, Workshop, May 30-June 1, 1946

impression of each is more nearly the expected.

The responses of the myope are ascertained when the wing of the mirror *is in motion*, originally, for he will tend to revert to his former impressions when the image is stationary.

After training the right eye for five to seven minutes with the ceramic in the right field, the ceramic is moved to the left field and the left eye is trained in the same manner.

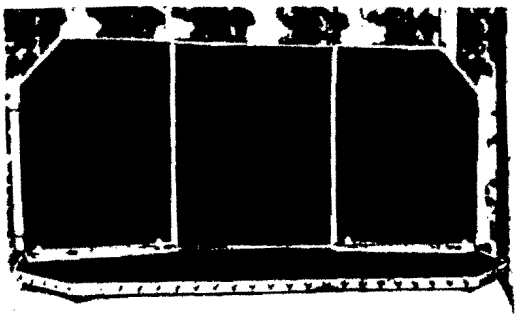
After the patient has been taught to control the image for both size and contour when moving the wings of the mirror (from a 45 degree angle with the central mirror toward the ceramic) he is tested again on the BU 21 target, and his positive and negative relative amplitude findings are taken. When he is able to control the image so that it "looks like" the original during the entire "in stroke" he should reveal a change in his positive and nagative findings. The positive finding should become lower and the negative finding somewhat higher, when taken to blur, indicating that the trend is toward a balance between the two. The circle in the BU 21 test should now have moved within the scene and the cross should be seen somewhere behind the circle, even if only a little way. In other words, he should now associate stereoscopic figure with ground and should interpret from disparate points in a stereograph, at least in the foreground.

If the positive and negative relative amplitude findings of the patient do not show a trend toward a balance as taken to blur, without a change in size of the letters, and he still sees the circle and the cross outside the schema toward himself during the BU 21 test, your mirror training has not been effective. Training with the "in stroke" of the mirror should be continued until the expected response is obtained.

From the nature of the technique it should be obvious that you have been engaged in training the positive relative accommodative function during training with the "in stroke" of the mirror. When satisfactory results have been obtained with the "in stroke" of the mirror, the following procedure should be instituted.

The ceramic is placed in the right mirrorred field, as before. The procedure is the same as for the previous step, except that the mirror is now moved from the 45 degree angle away from the patient as far as possible with the eyes open, and toward the patient to the 45 degree angle position with the eyes shut. Thus, with the eyes open only on the "out stroke" of the mirror, you are obviously training the negative relative accommodative function, since though working monocularly, you cannot, of course, entirely exclude the binocular function. When the patient can control the size, shape, contour, color and brilliance of the image, as compared to that of the original, on the "out stroke" of the mirror, you may again take his positive and negative relative accommodative findings and get his responses to the BU 21 skill test.

The negative finding should now be coming up in relationship to the positive finding and there should not be over .75 to 1.00 diopters difference between them. The circle in the BU 21 test should now be localized back, toward the tram car, and the cross should be well toward the mountain, as seen through the circle. If he is unable to localize the circle and cross in relationship to the stereoscopic background in the expected manner, and if the negative finding is more than one diopter lower than the positive finding, you have not been getting the required response to the "our stroke" of the mirror training. Such training must be continued until the required responses are obtained.



The Three Way Mirror

Since the "out stroke" mirror training is designed to train the negative relative accommodative function and the "in stroke" mirror training is designed to train the positive relative accommodative function, when the positive and negative relative amplitude findings begin to approach a balance, when taken to blur, the patient is then able to interpret with greater facility and accuracy from disparate points in both the positive and negative directions from the horoptor plane. When he is able to associate the stereoscopic figure with the stereoscopic ground, he is able to interpret from disparate points in a stereograph, also, and is therefore ready for training in a stereoscope.

He may be ready, too, for accommodative rock training, either on print or on pictures drawn in perspective (line drawings). Now he should *not* interpret a change in the size of letters if trained with print on a flat surface through plus and minus lenses if he has given an appropriate response to mirror training, providing, of course, the amounts of plus and minus used *are not in excess of the posi-*

indicated. 2. If the cross is *anywhere* behind the circle, regardless of the position of the circle in relationship to the scene, you may add plus, binocularly, until the cross appears to *begin* to approach the circle. 3. Any more plus than permits the cross to remain at its original position, or the original distance from the circle, is contra-indicated.

When the cross begins to move *toward* the circle, the plus is obviously interfering with the patient's facility for interpreting from disparate points in space and will encourage the patient to project in the positive (toward himself), rather than in the negative (away from himself) direction. His positive finding will then tend to measure much higher than his negative finding.

This is a method of prescribing plus accurately for the myope (when you are unable to determine his nets from the findings as taken to blur) and you may be sure that the patient will seldom, if ever, have a tendency to pull the book or paper toward himself through the plus prescribed in this manner, and will therefore tend to become less myopic rather than more myopic through his plus add.

Note: This article contains only the extreme primary phase of mirror training. Presentation of the several and varied advanced techniques will follow at a later date in other articles written for publication.

Note: The mirror, as described in the article, may be obtained through the West Michigan Optometric Association, 630 Grand Rapids National Bank Building, Grand Rapids 2, Michigan.

Bank of America Building

Sheridan to Conduct Chicago Classes Again This Year

The approach of the fall season brings with it the announcement that Dr. Leo A. Sheridan will return to the Chicago metropolitan area with new material for optometrists. Classes covering the primary course as well as the advanced course are being planned for now.

During the past winter and spring months more than 50 optometrists studied diligently under Dr. Sheridan's tutelage in Chicago. The O.E.P. technique was entirely new to some of the men, while others took the course only to refresh themselves and gain new information since their first course with this capable instructor five years previously. Practitioners of many years' standing and new licensees sat side by side in class and ironed out some of their own difficult cases with Dr. Sheridan's guidance.

Classes will be arranged for Monday, Tuesday and Wednesday evenings and Wednesday afternoons to suit the convenience of those interested in this course. The Wednesday afternoon sessions have been planned especially for optometrists living in Milwaukee, Aurora, Dixon, Gary or other cities easily accessible to Chicago by train or auto.

Dr. Sheridan will give four introductory talks without charge, to which all optometrists and students of optometry are cordially invited. These will take place on Monday, Tuesday and Wednesday evenings, and Wednesday afternoon, September 23, 24 and 25 at the Morrison Hotel unless otherwise announced. Further information may be obtained from Dr. A. E. Norman, 5750½ West Chicago Avenue, Chicago, Illinois.

A.O.A.'s Public Health Bureau Library Receives Gift

Dr. J. Ottis White of Baton Rouge, Louisiana, recently presented to the public health bureau library of the A. O. A. in Pittsburgh, Pennsylvania, these books written by Dr. Charles Sheard: *Ophthalmic Glasses; Ocular Accommodation; Reprints of Articles on Accommodation and Convergence; The Prescription of Prisms; Considerations Regarding the Analysis and Interpretation of Data on Ocular Convergence and Accommodation* (Introduction and Parts 3 and 4); *Physics and Physicists in Medicine; Duction Amplitudes, The Significance of the Findings in Diplopia, Blur and Refusion; The Importance of a Consideration of Muscular Defects of the Eyes from the Innervational Standpoint; Accommodative or Physiological Exophoria; The Effects of Intensity of Illumination on Presbyopia, Accommodation and Convergence; Glarometric Measurements on Ocular Photosensitivity; Dynamic Skiametry;* and the following copies of the *American Journal of Physiological Optics;* January 1924, April 1924, July 1924, October 1924, January 1925, April 1925, July 1925, October 1925, January 1926, April 1926.

Also included in the gift presentation were the following books and booklets that contain valuable source material: *Ophthalmometry*, E. LeRoy Ryer; *Why We See Like Human Beings*, Better Vision Institute; *Stimulus-Response Manual*, Carl Shepard and Thomas Atkinson; *Occupational Analysis*, Better Vision Institute; *Squints and Heterophorias*, Ray Morse-Peckham; *Controlled Reading*, Earl A. Taylor; *Orthoptic Training with the Stereo Orthoptor; The Modern Treatment of Binocular Imbalances*, Ray Morse-Peckham; *A Quantitative Study of the Visual After Image*, William Feinbloom; *Perimetry and Campimetry*, Ralph I. Lloyd; *Bifocal Analysis in Anisometropia*, Irving B. Lueck; *Bulletin of Lectures*, California, June 1928; *The Stereoscopic Development of the Fusion Faculty; The Improved Wellsworth Dezeng Phoroptor and its Use in Ocular Refraction; The Telescopic Spectacle and the New Subnormal Vision Lens*, William Feinbloom; and the *Fitting of Contact Lenses for Persons with Ametropia*, T. E. Obrig.

tive and negative accommodation you were able to develop through the use of mirror training. Obviously, it is not good procedure to give accommodative rock training on print as long as the patient interprets a change in the size of the letter through either the minus or plus lenses employed. If he does, it indicates, of course, that he is still substituting a change in size for the projected distance required by the plus or minus lenses used. Also, as was explained previously, when describing the reaction to being tested with plus and minus lenses when attempting to measure the functions of positive and negative relative accommodation, he may be projecting in the *opposite* direction from the one intended or expected for the particular lens employed during training.

I am sure that it must be apparent by this time that the size-distance relationships are inter-related with the positive and negative relative accommodative functions. If these findings are out of balance, it would indicate that his perception of size, contour and distance had been altered from the expected, in his endeavor to maintain the interpretation he desires. His size-distance relationships are directly dependent upon his facility for accurate interpretation from disparate points in his space world. Conversely, through changing his interpretation of his space world and altering his interpretations of size-distance relations, his positive and negative relative accommodative findings may be altered. The purpose of mirror training is to encourage him to interpret accurately from disparate points for solids and distances in space so that the accuracy of his impressions and perceptions, and consequently his negative and positive relative accommodative findings, may be improved.

By this time you are probably beginning to remember what happened to that myopic patient who became even more myopic through the plus add you prescribed! Remember, he brought the book or paper nearer to his eyes when wearing the plus add? By this form of behavior he was trying to tell you that he was interpreting a larger image. Therefore, he believed it to be nearer and so he felt more comfortable with the book nearer to himself. You were encouraging him to posture in the *positive* rather than in the *negative* direction, and to favor his positive, rather than his negative accommodation while reading. That is to say, you were tending to raise the positive finding in relationship to the negative finding, rather than to lower the positive finding, as you had hoped to do with the plus lenses!

Consequently, I have designed a simple technique for fitting bifocal lenses to the myope whose nets are difficult to figure from his cross cylinder findings and from his positive and negative relative amplitude findings.

This Extension Program of ours never ceases to amaze me. It is the most beautiful piece of work I have ever been privileged to look upon, and the more I work with it, the more I appreciate it. They taught us to figure our nets and to figure that amount of plus or minus that did not interfere with the patient's ability to interpret from disparate points in space. However, you cannot take accurate blur points on the myope because of the changes in his size-distance relations, which change both the quantity and quality of the positive and negative relative amplitude findings. Therefore, as previously explained, we are unable to figure accurate nets for the myope.

There is another reason, and that is, that the 14A and 14B (cross cylinder findings at near) of the myope are often inaccurate. Since some myopes favor interpretation from *corresponding* points on the horoptor, these patients simply get a broadening or thickening of one set of lines or the other, rather than seeing the vertical lines as being distinctly blacker which is the expected, and, since the technique consists of adding plus until the vertical lines of the cross cylinder grid are blacker than the horizontal, we are unable to get the appropriate response from many myopes. Such a reaction to a cross cylinder test would seem to substantiate the evidence that he prefers to interpret from the horoptor plane, rather than in either the positive or negative directions, off the horoptor. In such an instance, he is unable during the test to interpret the interval caused by the *half diopter cylinder* employed for the test. Therefore, one set of lines, or the other, remains persistently distorted and he interprets the *distortion* as *blacker* lines. Since it is impossible to figure our nets without the fused and unfused cross cylinder findings at near, or the positive and negative relative amplitude findings, it has often left us feeling rather helpless as to just how much plus, over his distance prescription, we are justified in prescribing for near point work—to *prevent the progress* of the myopia!

Here is the technique, then, for fitting bifocals to the myope who persists in holding his book nearer to himself through the plus add than he does without it. Use the BU 21 test card in split form and place it in a split-slide holder (stereo-disparator or ortho-split-slide holder) at orthophoria at 1.25 diopters on the telebinocular shaft. (It has been determined that 85 millimeters is orthophoria at far and 62 millimeters is orthophoria at 2.50 on the shaft.) Make the test as for the skill test with the BU 21 sterograph, asking the same four questions. 1. If he reports that the circle is *outside of the scene toward himself*, and that the *cross is within it and in the same plane as the circle, all plus for near is contra-*