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**New
Techniques**

of

**Vision
Improvement**

Charles R. Kelley

A unique synthesis of vision training techniques from William H. Bates and methods of deep emotional release rooted in the work of Wilhelm Reich.

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NEW TECHNIQUES OF VISION IMPROVEMENT

Charles R. Kelley

Most people are surprised to learn that there are techniques that can substantially improve eye conditions usually thought of as fixed and incurable, such as myopia, hyperopia, and astigmatism. This contradicts the position of the medical and optometric professions that the eyes are a fixed optical element that cannot be modified except in unusual cases. The traditional position holds that educational procedures can do no more than improve the interpretation of visual information which is of inherently fixed quality. Thus the basic visual input is conceived of as being unchangeable (save in rare instances) and the value of training limited to improving the way in which this fixed "input information" is utilized, i.e., the process of interpretation by the brain.

My experience flatly contradicts this orthodox point of view. The view is contradicted by what I have learned as a scientist engaged in vision research, by what I have observed in students as a teacher of techniques of vision improvement, and by my direct experience improving my own vision. The eye is not an unchanging element bringing information of fixed quality to the brain for interpretation. The eye is a living organ, subject, like the rest of the body, to vicissitudes and variations of all kinds, especially in the functioning of the muscles within and surrounding it, and in the quantity and quality of the circulation delivering nutrients and carrying waste products from it. The eye, like the rest of the body, possesses an enormous capacity for change, both for the better and for the worse.

Vision changes all the time, and those with marginal vision are usually acutely aware of such changes. Vision is typically better in the morning than in the afternoon, better on a relaxed holiday than during an arduous period of work or study, better when relaxed and happy than when tense or emotionally disturbed. Nor is there any good reason for believing that it is not the "visual input," the optical quality of the image on the retina, that changes, rather than (or in addition to) interpretive factors in the brain.

It is muscles which direct the eye's line of sight, focus its image through accommodation, and regulate retinal illumination. And it is muscles which interfere with function when they become too tense or too flaccid, either condition interfering with ocular mobility and impairing circulation. It is mobility and circulation which the eyes require above all for both function and health. It is muscles, then, that are the primary agent for visual change.

The mechanistic view of the eye as a fixed optical system is a myth, full of contradictions and inconsistencies. The same practitioner who insists that it is impossible in principle for a 10-year old with one and a half diopters of myopia to reduce his myopia to zero in two years of training, must in honesty admit that it is very possible indeed for the 1-1/2 diopters of myopia to increase to 3 diopters in the same two-year period. The eye that is regarded as mechanically fixed with no potential for change in the direction of improvement is at the same time recognized to be flexible and subject to substantial change when it comes to getting worse.

And it is the same with other eye conditions. Muscular tension and impaired circulation can, and do, become

worse, and worsen the optical performance of the eye. Can they not also, then, given the proper changes in conditions and habits, become better? They can, of course, even though they seldom do. The truth is that vision can be improved by training, but seldom is because vision professionals do not know how. But one can learn a little about it, if he is willing to consider the experience of unorthodox practitioners.

I began work in vision improvement techniques as a teacher of the Bates method, and, seeing the need for research, became an experimental psychologist specializing in vision. While I was Director of the Division of Applied Vision Research and an Assistant Professor in the Department of Psychology at North Carolina State University in the years 1953-57, I prepared and off-printed an article summarizing my experience as a Bates teacher. In 1961 I updated the article for publication in the neo-Reichian journal, The Creative Process, which I then edited. That article has been reprinted several times, but there has been a need for it to be revised and supplemented in the light of our new experience with neo-Reichian techniques of vision improvement. Part 1 of this article is a revision of the original article on Bates and the Bates method. Part 2 is a personal account of my experience in the field of training and research in vision improvement. Part 3 then presents a new theory of myopia and hyperopia which has gradually evolved over the past 25 years, and Part 4 deals with the problems of vision improvement, contrasting more orthodox approaches with that taken in the Interscience Work Shop vision improvement programs. Parts 3 and 4 were first presented as a paper to the Institute for Bioenergetic Analysis, New York, in May 1969, and as a demonstration and lecture to the First International Conference on Bioenergetics, Isla Mujeres, Mexico, March 27-April 3, 1971.

Part 1. The Life and Work of William H. Bates*

Few areas of science have received as much attention as that dealing with how we see. At present, dozens, perhaps hundreds of articles on vision appear each month in scientific journals and other publications in the fields of medicine, optometry, physiology, psychology, education, art, etc. With so many scientists and scholars devoting effort to it, it would seem that major problems in the field should now be solved or that much progress towards their solution be made. Yet this is not the case. On the contrary, the major problems seem hardly to have been approached, despite the mass of research that has accrued. To illustrate: the human eye is afflicted with many disorders. Perhaps three-fourths of the world's population suffer from demonstrable visual defects. Major among these are refractive errors, disorders of binocularity or fusion, and several still more serious conditions, including cataract, glaucoma, and retinal detachment, all major causes of blindness. Conflicting theories about the etiology of each one of these appear in the literature on the subject. Study of this literature can lead to only one conclusion: neither the basic cause nor an effective cure is known for any of these conditions. The disorders are all, with the exception of occasional individual cases, considered basically incurable, and the physician or optometrist does what he can to compensate for the disorder mechanically through spectacles or surgery.

William H. Bates was a physician and scientist who took a new and unusual approach to the problems of vision.

* A revision of the article, "William H. Bates, Vision Pioneer." The Creative Process, 1961, 1(2), 66-80. Interscience Work Shop, Santa Monica, Calif. 90403.

He was a New York ophthalmologist who lived from 1860 to 1931. His theories of vision have never gained acceptance in the fields of science dealing with vision. His techniques for training eyesight have been denounced repeatedly in orthodox ophthalmological and optometric circles. Despite this, these techniques, usually known as the Bates system, have gained a tremendous following throughout the world. Ten or fifteen books, some widely circulated, have been written on the subject, and literally thousands of people claim to have benefited by the techniques originated by or stemming from the work of Bates. If the techniques of Bates are of little or no benefit, why have they gained such a large following? And if his techniques are beneficial, why have they been rejected so completely by the great majority of ophthalmologists and optometrists? Let us explore the history and present status of the Bates system, in an attempt to find answers for these questions.

Bates' background was completely orthodox. As a surgeon, he operated in several New York hospitals. In 1886 he introduced a new operation for relief of persistent deafness, consisting of incising the ear drum membrane, an operation in use today. As a research physician, it was Bates who discovered the important functions of the suprarenal secretion later called adrenalin. Though no article on the widely publicized adrenal corticoids mentions his name, he was administering extracts of the adrenal cortex experimentally before the turn of the century.

As a young man, Bates was accepted as a brilliant and able physician. He was an instructor in ophthalmology at the New York Post-Graduate Medical School and Hospital. His articles were published in standard medical journals. His position in the profession seemed

well-established and secure. Yet, in the course of two or three decades his scientific achievements were forgotten. He was criticized and often defamed in orthodox medical circles. In the minds of many the name of Bates became synonymous with quackery. Not only his theories but his person was attacked, in a fashion that left him and those associated with him hurt and perplexed.

The first of Bates' difficulties came in the pursuit of his ophthalmological practice. He quickly became dissatisfied with fitting glasses, because it seemed to him that eyes seldom improved and very often got worse with their use. He began experimenting with other methods of treatment and found that certain techniques of training appeared effective. While investigating these techniques further, he removed the glasses from certain of his near-sighted patients, including some of the students at the medical school. This provoked so much hostility on the part of many of the other members of the faculty that Bates was expelled from his position. He requested an experimental test be made of his contention that myopia could be improved by training. He was told that Donders, a world-renowned ophthalmologist, had said myopia was incurable and that he (Bates) should not claim to know more about the subject than did Donders.

After this, Bates carried his research in vision training much further. He left his profitable New York practice and moved to North Dakota, where he spent several years doing experimental work. Bates never restricted himself to the usual eye examination room, but carried his retinoscope with him, inspecting the refractive state of the eyes of both people and animals in many different situations. He refracted eyes of people when they were happy and sad, angry and afraid. Much of his time was spent with children,

attempting to discover the genesis of eye disorders. His retinoscopic findings indicated that the refractive state of the eye was not the static condition text books stated, but varied tremendously with the emotional state. He published an account of a little girl who developed temporary myopia when she lied to him -- a fact which seemed to him of significance, since it was consistent with other findings of his about myopia (e.g., people tend to become myopic when apprehensive). This account was ridiculed in the ophthalmological literature. Bates' activities with the retinoscope were considered eccentric at best by most of the fellow members of his profession.

Bates' conviction grew that vision could be improved by training. He developed a system of training out of his research and applied it to his own patients, often seeming to get excellent results. He developed, too, a theory of accommodation based on action of the extrinsic eye muscles rather than the lens, as in the traditional Helmholtz theory. Bates' theory of accommodation has not been confirmed by subsequent research, though many of the questions he asked about accommodation have never been satisfactorily answered. For example, if accommodation is entirely dependent on the lens of the eye, why is it that some eyes in which the lens has been surgically removed may still possess the power to accommodate? This phenomenon has been observed in established vision research laboratories.

Bates felt that refractive error was a result of chronic contraction or tension in certain of the extrinsic eye muscles, which resulted in a functional deformation of the eyeball. His training techniques succeeded, he felt, when they relieved these chronic tensions. However, the tensions proved generally inaccessible to conscious control. To get to them indirectly, Bates turned his attention to the

mental side of seeing. He became convinced that defective vision was always accompanied by an anomalous mental state. He stressed the correspondence between the field of consciousness, in which there was a central point of clear awareness surrounded by a field of increasing vagueness, and the field of vision, which has the same sort of structure. He found this field of awareness was disturbed in two ways in his eye patients: first, the attention was immobilized, failing to move freely from one object or aspect of an object of attention to another; secondly, attention tended to become decentralized, to lose its focus, to spread in space. These disorders of attention were always accompanied by some sort of effort or strain and accompanying muscular tension. He therefore tried to develop ways of relaxing, mobilizing, and "centralizing" mind and eyes, having come to feel the two were functionally inseparable.

The work of Bates drew increasing criticism from orthodox members of his profession. While some of it was leveled at the scientific aspects of his work, more and more of it developed into a ridicule of his approach to defective vision and a defamation of him personally. His notable scientific accomplishments were forgotten or ignored, as was the tremendous sacrifice in money and prestige he made to follow the principles he came to believe in. His critics closed their eyes to self-evident facts about Bates, including the obvious fact that he was sincere, honest, and intelligent. His earlier scientific accomplishments obliged his professional colleagues to give his unorthodox theories serious thought and honest criticism, but they failed their obligation. The following paragraph about Bates from a popular book on eyes by an ophthalmologist of considerable standing, is typical. The chapter in which the paragraph occurs is headed, "Quacks and Panaceas."

... there have been many of agile wit and easy conscience who have not scrupled to take advantage of our objections to seeing better at the expense of our looks. About twenty years ago the now immortal PERFECT SIGHT WITHOUT GLASSES was given to the world. It was written by a man who had discovered that many would gladly pay more to be convinced that they did not need glasses than that they did need them. (Fox, S., 1944)

After his years of study in North Dakota, Bates returned to New York. Despite the reaction of orthodox medicine, he soon developed a large following, including a small number of physicians. It became impossible for him to personally handle all those who came to him, and he trained others in his techniques. Since comparatively few ophthalmologists were interested, most of the people he trained to use his techniques were laymen. These people opened practices in all parts of the country, and the Bates system began its growth in this way. Bates' following steadily increased, and after his death in 1931 others began training teachers to meet the growing demand. Today there are hundreds of these Bates system teachers throughout the world, trained by Bates himself or his followers.

Major among the teachers trained by Bates was Margaret D. Corbett. Mrs. Corbett founded a school for training Bates teachers with branches in several cities. Her school gave an intensive course of training in the Bates system, and the system itself evolved considerably under Mrs. Corbett. It was Mrs. Corbett who trained the writer Aldous Huxley. As a result of his experience with

Mrs. Corbett, Huxley wrote the book **THE ART OF SEEING**, published by Harper & Bros. This is probably the most important book on the Bates system written since Bates' death. Since Mrs. Corbett's death in 1965, Bates training has been on the decline, but there are important signs of revival. New experimental growth centers such as Esalen and Kairos Institutes in California and Aureon Institute in New York are sponsoring workshops in vision in which Bates' techniques are taught.

The Bates Vision Training Techniques

The techniques here described are those of Bates himself and of Mrs. Corbett. This point is important, since many variations exist. Certain variants of Bates' techniques have been developed into systems of "eye exercises." These are only remotely related to the teachings of Bates, though they may appear under his name.

Sunning. Bates felt that sunlight was very important for the eyes. He blamed indoor life for deteriorating both the light tolerance and health of the eye. His patients were seldom able to stand bright sunlight without discomfort. He had his patients learn to relax their eyes in sunlight and then expose their eyes to increasingly long periods of direct sun. When the patient could accept it without tension, he used a small magnifying glass to focus concentrated sunlight on the white of the eye, moving the point of focus continually. This has the effect of flooding the eye with intense light. Mrs. Corbett did not use the magnifying glass nor have her pupils fixate the sun directly, but instead had them sun their eyes by moving the point of fixation across the sky. Sunning is the most severely criticized of all the Bates techniques.

Palming. Bates developed a technique for resting the eyes in which the eyes are closed and covered with the palms. This is one of the empirically developed techniques which came to have great significance in the Bates system. The beneficial effects of palming are stressed repeatedly by Bates teachers. Why it seems to be effective is not often made clear. The warmth and darkness of the palms are said to stimulate circulation; yet a dark mask and the application of heat are not acceptable substitutes. However, many teachers will tell you what books on the subject omit or state equivocally: that there is body electricity or other form of biological energy in the palms, and the flow of this energy is fundamental to the benefit palming gives.

Swinging. Because the eyes of his patients were so often tense and immobile, Bates developed a group of techniques which can be described under the general heading of swinging. In these techniques, the head and usually the whole body are turned or swung in a rhythmic movement, the object being to get a relative movement of the person swinging and his visual field. The eyes respond to swinging with saccadic movements, which increase in number as the eyes relax. The swings are done in a dance-like fashion, so that they themselves constitute a relaxed type of physical activity.

Relaxation Training and Imagination. Bates and his followers found that people with eye problems were invariably physically tense in some way, and at the same time were mentally apprehensive or anxious. They attempted both to teach people to relax muscularly in a direct way and to relax and mobilize their attention. The latter is primarily accomplished through techniques of memory and imagination, usually involving vision and the other senses. Bates was convinced that a "mental strain" caused faulty vision and also made clear mental imagery

impossible. He worked to teach people to remember or imagine things clearly, insisting that when he succeeded there was invariably a concomitant improvement in vision. Many Bates teachers think it of primary importance to have their students imagine pleasant scenes, employing touch, smell, taste and hearing, along with visualization of color, motion and form.

Breathing. Mrs. Corbett and her teachers placed special emphasis on breathing. They noted that faulty eyesight seems always to be accompanied by faulty breathing. Teachers repeatedly remind their students to breathe easily. In addition, they have noted that improvement in vision occurs with a relaxed exhalation, and they make use of this continually in teaching.

Application of Techniques

To make it more clear how the Bates teacher applies the above techniques, a typical Bates lesson will be described, assuming that the student is a near-sighted adult. At the beginning of the lesson the student stands or sits in the sun (or in bright artificial light) with his eyes closed. The teacher talks to the student, getting him to relax and breathe easily in the bright light. If he can, without straining, the pupil then opens his eyes, shades one eye with his palm, and allows his attention to move freely across the sky, under, across, and above the sun. He repeats this with the other eye. The teacher is alert for any sign of straining, and will have the student close his eyes as soon as strain appears.

After a period of sunning, the student is seated to palm. He usually rests his elbows on a cushion on his lap, and his head rests on his hands with his palms covering his closed eyes. After he is settled comfortably,

and the teacher sees that he is relaxed and breathing easily, the teacher suggests he imagine he is lying on the beach on a sunny day. He is asked to imagine the feel of the hot sand under him and the feel of the sun on his body; can he hear the sound of waves breaking in the surf? Does he smell the salt air? After the setting is laid, the teacher creates the visual scene at the beach for the student, with details of forms, colors, and movement. If the student responds well to the "mental picture," his body will relax, his breathing "let down," and when he opens his eyes and looks around, the scene will be brighter and often clearer, and colors may appear strikingly vivid, more so than they would after a similar period in the dark without palming.

The student then stretches, after which he does a "swing." In this, he stands and turns his body back and forth through about 180 degrees of arc, shifting his weight from one foot to the other as he turns. The eyes are relaxed, and no attempt is made to see objects, though the student is told to be aware of the movement of things in his visual field. If the student is relaxed when he swings, he will breathe and blink easily, and his eyes will make many saccadic movements each swing.

After the "swing," the student is given "vision stretching work." Strips bearing a graduated series of letters are frequently used. The teacher holds the strips at a distance, watching the student for the first signs of strain. As soon as the student reaches letters too small for him, he tenses, inhibits his breathing, and strains to see. The teacher has him close his eyes, loosen up, sigh easily, and open his eyes on the exhalation. Often the letters will now be clear. Further relaxation techniques make it possible to clear strips of progressively smaller letters in a similar manner.

After he has cleared several letter strips of increasing difficulty, the student will generally become quite tense, and the teacher switches to something more relaxing. Teacher and pupil may play catch, after which the pupil will palm some more, and the lesson will be over. It will have taken an hour or an hour and a half.

Bates and the Cause of Defective Vision

Bates' grasp of the nature of visual disorders set him completely apart from the traditional mechanical approach to vision. He was the first man to see that defective vision was regularly accompanied by patterns of muscular tension and by abnormalities in the mental state, especially immobilization and diffusion of attention. These insights have not been grasped by the most "modern" scientists working with visual defects today, yet they were developed by Bates more than half a century ago.

However, careful analysis of the work of Bates shows that the most crucial question about faulty vision was never answered. The genesis of the defective attention and the muscular strain responsible for most vision problems was never satisfactorily accounted for. Without such understanding, Bates could not arrive at the true cause of the disorders of sight, which lies deep in the character development process, as described by Wilhelm Reich and elaborated by Alexander Lowen.

Bates did have insights of an intuitive sort as to the childhood conditions relating to the origin of the eye defects. For example, he realized clearly the harmful effect of compulsion in the education process, as evidenced by statements like the following:

It is as natural for the eye to see as it is for the

mind to acquire knowledge, and any effort in either case is not only useless, but defeats the end in view. You may force a few facts into a child's mind by various kinds of compulsion, but you cannot make it learn anything. The facts remain, if they remain at all, as dead lumber in the brain. They contribute nothing to the vital processes of thought; and because they were not acquired naturally and not assimilated, they destroy the natural impulse of the mind toward the acquisition of knowledge....
(Bates, 1920, p. 106)

Although statements such as these indicate Bates had real insight into conditions relating to the genesis of poor eyesight, he did not "follow through" on his feelings in this regard. He never related the disorders of consciousness he found in his patients to a basic disturbance in their capacity to experience and express deeper feeling. This proved to be his fundamental limitation.

Effectiveness of the Bates System

A crucial question, and one this author has never seen answered satisfactorily in print, is: "How well does the Bates system work?" In regard to refractive error, Bates system adherents frequently claim that "perfect" sight without glasses, at least as good as can be had with glasses at the outset of training, commonly occurs with Bates training. Bates' original book implies this is true by both title and the contents. Ophthalmologists and optometrists, on the other hand, generally assert no improvement in refractive errors can take place by training, although a little improvement in visual acuity without change in refractive error is sometimes conceded.

This author's experience with the Bates system is such that he can answer many questions regarding its effectiveness. Because this experience contradicts much of what is taught about vision in standard texts of ophthalmology and optometry, as well as the claims of many Bates system followers, I have been careful to base this evaluation on cases I personally know about. Except where specifically stated otherwise, the discussion that follows is based on cases I taught myself, or with which I had other personal contact.

With the great majority of cases, Bates system training does not lead to uncorrected vision equal to that which can be had by use of glasses, except in the very special situation of the Bates teacher's studio and for certain short periods outside. The great majority of students with a marked degree of refractive error never obtain "perfect sight without glasses," save for these brief intervals. Yet a genuine large improvement in sight, often including a substantial reduction in refractive error, is the usual result of the method. Figure 1 shows the progressive improvement in acuity of a myopic student this author trained whose progress was in no way unusual. The student was a 17 year old girl who had been myopic from childhood. Her original test acuity was 3/200, her original prescription, -6.00 D sphere, each eye. The accompanying changes in refractive error are not available, but her prescription was weakened twice during the course of lessons.

Most of the myopes the author has known who studied the Bates system reached the point where they got "flashes" -- brief intervals of clear vision. Yet, very few of them were able to maintain this clear vision during most of their normal activities. Their basic vision, or vision aside from the brief clearing spells or flashes, always improved somewhat, and often improved remarkably, though it

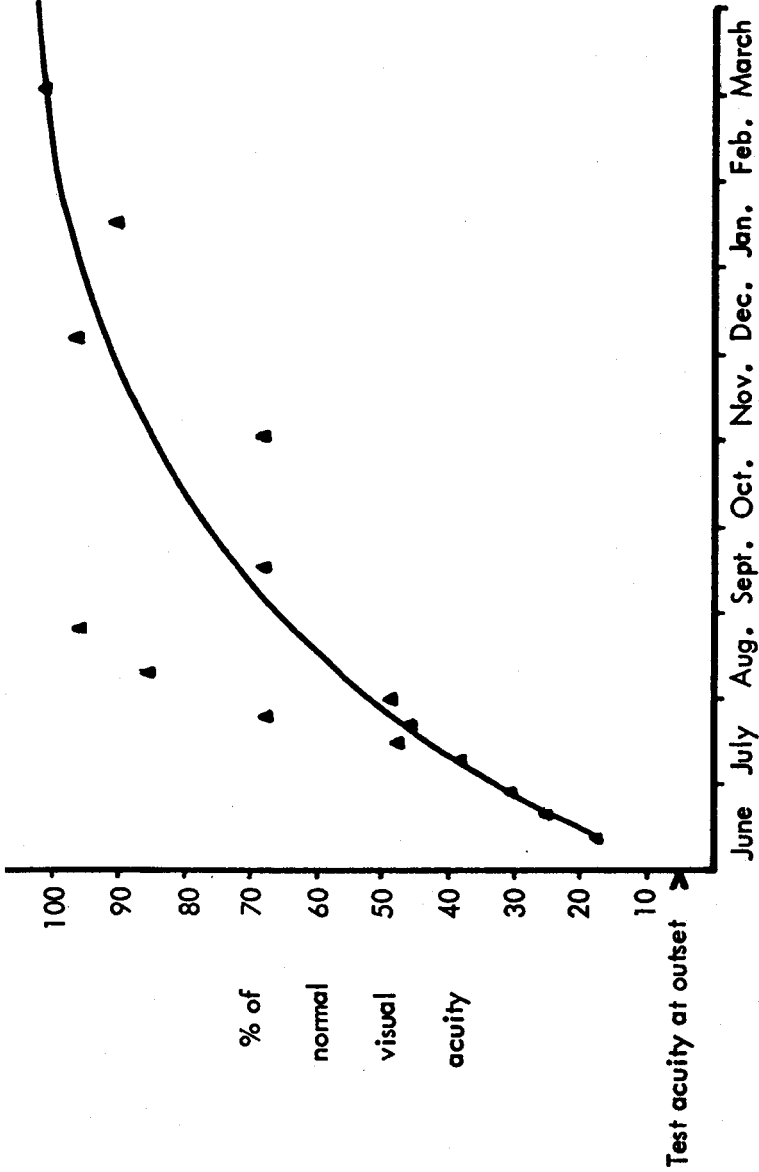


Figure 1. Improvement in visual acuity with Bates training. These are not test acuities, but represent the smallest line of letters read from a chart during the course of a Bates lesson. Usually they represent a brief but genuine clearing. Squinting, or other trick methods of seeing the letters, were never permitted. Many different letter charts were used.

generally fell short of normal in the end. However, a few myopes have been encountered who were able to improve their basic vision only slightly by the Bates method, despite apparently serious effort. In an experimental study of myopia, this author was able to demonstrate that psychological techniques derived from Bates could bring about large temporary improvements in myopia and that these improvements were a result of a reduction in refractive error independent of accommodation (Kelley, 1958).

Astigmatism seems to be more variable and sometimes (but not always) improves faster than other types of refractive error. An elderly acquaintance (70 years old) practised Bates techniques vigorously without supervision for three months, after which his ophthalmologist told him his astigmatism had been reduced by more than 50 percent. His experience is not unusual.

Presbyopia, or "old-age sight," seems as responsive to training as other refractive problems. Persons in their sixties who have worn bi-focals for years learn to read the smallest print without glasses while in the Bates teacher's studio. However, this author's experience is that those having presbyopia of long standing usually do not have normal near-point vision in most situations; they most frequently depend on reading glasses, though there are exceptions. There is not the slightest doubt, however, that the presbyope's ability to accommodate can be greatly improved by training. The age at which reading glasses or bi-focals must be worn can be postponed for years and sometimes decades. This contradicts the accepted belief which asserts that such improvement is impossible, because of the hardening of the eye's lens with age.

Simple muscular "strain" is an eye condition particularly

amenable to Bates training. Eye strain may or may not be accompanied by refractive error or other visual disorders, though a degree of hyperopia (farsightedness) is common. Severe eye discomfort can respond well to this type of training. This author has taught some and has known many cases where severe recurrent eye pain or headaches disappeared after training. By no means all cases of eye strain respond, but this author's experience is that the largest proportion do. Hyperopia, when present, usually responds somewhat more quickly to training than does myopia.

In squint or strabismus, binocular vision is absent or seriously impaired, and the squinter sees through one eye, usually turning the other off focus. This condition sometimes clears up completely with Bates training. All degrees of squint, at all age levels, have been known to respond. While it cannot be said what the percentage of success is, genuine fusion, with the consequent restoration of the vision of the squinting eye, does occur. It is the author's impression that the skill of the teacher is particularly important in squint, and that a few of the best teachers succeed in bringing fused binocular vision in most of their young squint cases, but that all teachers have some failures, and most have many.

Eye Appearance and Health. I have again and again seen eyes change their appearance remarkably with Bates training. Bloodshot and gray scleras become clear and white; eyes open wider, and wrinkles, squinting, etc., improve visibly. Even gross deformities are sometimes modified. These facts are stated strongly, because they are the most easily observed and frequently noted results of the method. As a matter of fact, general eye appearance sometimes changes greatly within the course of a single lesson, with eyes opening wider, muscular tensions around the eyes softening, and the eyes appearing brighter.

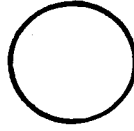
Other Eye Disorders. I have also been in a position to observe the effect of the Bates system on many very serious eye disorders. The results have at times been striking. I have seen three cases of cataract, none severe, clear completely with training. Figure 2 shows the results of training with two students. The figures were obtained by the use of the opastroscope, an optical instrument which projects an image of the lens of the eye of the user onto the macular area of the retina. Partial cataracts are clearly outlined, and can then be drawn by the subject. Subject A, a 45 year old woman, had a crescent-like opacity in the left eye, which disappeared completely after 6 months of training. Subject B, a 14 year old girl, began training with gray haze-like congenital opacities, with scattered clear spots, in both eyes. The opaque matter gathered into branch-like formations, which decreased in area and retreated to the lens boundary, then disappeared entirely 5 weeks after training began. Other teachers have reported similar results with cataract. Bates describes several cases of cataracts clearing, attributing most of the results to palming. Ripe cataracts cannot usually be expected to clear, however.

A physician suffering glaucoma came to me for Bates work during the excruciating pain of an acute attack, taking the responsibility herself for damage that might result to her vision. In 45 minutes she was sound asleep, relaxed and free of pain. She continued Bates work, and in the two years I knew and worked with her she had no further glaucoma attacks.

I have known eye cases regarded as medically hopeless that recovered with training in the Bates system. One was a middle-aged man, effectively blind from glaucoma and recurrent hemorrhages in his eyes. He went to the finest

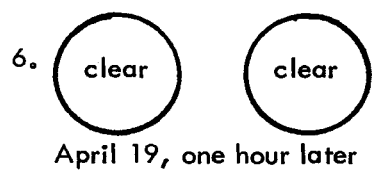
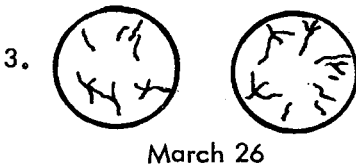
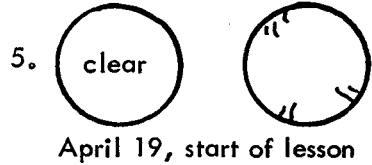
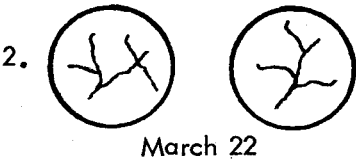
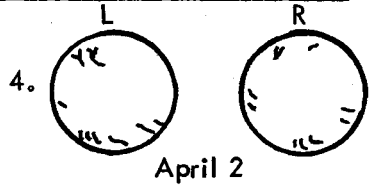
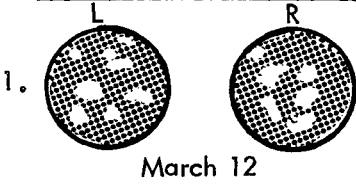


April 29



September 18

SUBJECT A



SUBJECT B

Figure 2. Two cataract cases taught by the author as a Bates practitioner.

eye specialists in Australia, England and the United States, and was advised to have one eye removed and not to expect much sight from the other. He went to Mrs. Corbett instead, and devoted himself seriously to the Bates method. From that time on, he never had another eye hemorrhage. His vision improved greatly, he had no more attacks of glaucoma, and he was able to return to his job with excellent eyesight in both eyes, uncorrected by glasses.

I have met and spoken to other equally remarkable cases, such as a man with a complete retinal detachment who began training immediately after the detachment occurred. The retina completely and permanently reattached, and eventually better visual acuity developed than was present before the retinal detachment. Teachers report that facial and visual paralyses (e.g., Bell's Palsy) respond especially well to training, though I have not known these cases personally. However, it should be pointed out that results are not obtained easily with serious cases. Those who succeed apply themselves diligently and intelligently to the training program set up for them. Some of them devote time each day for months and often for years to "home-work" drills. As a result of their perseverance many are able to save or restore much of their sight, though there are also the heartbreaking cases who work hard to little or no avail.

Eye conditions in which inherent structural factors severely limit what can be accomplished still can be decidedly improved. An eight-year old student of mine had a coloboma of the retina and choroid of each eye, a congenital condition that left him with no central retina. What vision he had was obtained via a crescent of intact peripheral retina across the top of each eye. Legally blind, the little vision he had was scattered

almost uniformly in his fringe of a retina. He could read large type at three to four inches with his better eye. His vision greatly affected his posture and body structure, which was severely distorted to provide the better eye a favorable angle.

Two and one half years of vision lessons two and three times a week, each lasting 90 minutes, plus a regular daily homework routine, brought remarkable changes. A false macula was gradually developed in the peripheral retina of each eye. As this occurred the acuity improved, ultimately by nearly an order of magnitude. Instead of expanded print read monocularly at three to four inches, the boy became able to read normal print at eight to ten inches with both eyes participating. Instead of studying Braille, he became able to enter regular school classes, reading better than his grade level. His posture straightened and body structure returned entirely to normal.

Such a case sounds like a minor miracle in summary, but two hundred fifty hours of individual instruction plus five or six hundred hours of diligent homework are not ordinarily required for a miracle. What it was was hard work, often tedious, often discouraging, but also challenging, exciting and, in the long run, deeply rewarding.

Bates teachers seldom stress these serious cases. The status of Bates teaching as a profession is insecure, and laws restricting or prohibiting its practice are increasing. Nothing provokes the hostility of much of the ophthalmological profession more violently than to learn that a lay person is trying to cure very serious "incurable" eye disorders. When the Bates teacher proceeds without medical advice, the reaction is in part justified, since many of these cases need close medical supervision. The

Bates teachers known by the author have required that such cases remain under medical care, even though the doctors involved were unsympathetic to the Bates method.

The Lay Practitioner

The problem of the lay practitioner in Bates training is a serious one. The established professions deal with eye problems so mechanically that it is impossible for them to incorporate Bates methods into their practice. The widespread nature of visual disorders, the futility of approaching these disorders mechanically, and the large measure of success possible with Bates' simple techniques, all encourage growth of a lay practice. There is no doubt this lay practice has done a tremendous amount of good. It has kept Bates' work alive and has brought better eyesight to thousands, saving many from blindness. Further, the author has never known of one case of harm resulting from the Bates method.

On the other hand, there are many serious faults with the Bates movement. Like other reactions against scientific mechanism, there is a strong mystical component at work which gives the movement a somewhat cultish aspect. This mystical element shows up especially in a tendency to follow "psychological" cure fads. From Coue's "auto-suggestion" to Salter's "conditioned reflex therapy," from Jungian psychoanalysis to L. Ron Hubbard's "scientology," from Christian Science to Zen to Yoga, -- all have found adherents among Bates' followers in the author's acquaintance. Through it all can be seen the unending search for a magic formula to solve the difficult unanswered problems of human life.

To many, the Bates method becomes such a magic

formula. This results in an inability to evaluate it objectively. The magic formula is supposed to work perfectly, and failure is never due to the formula, but rather to its particular application. In consequence, Bates' adherents often have deluded themselves about the effectiveness of the method. Many books on the Bates method make it appear that refractive error will disappear with training. Actually, this happens only rarely. Most myopes will, after months or even years of training, remain myopic to some degree. Most presbyopes, though greatly improving their power of accommodation by following Bates techniques, will in the end resort to reading glasses.

Yet any fair and thorough investigation of the Bates method will find it to be enormously more effective than its critics claim. Bates showed, for all who are willing to look, that the visual defects regarded as fixed and immutable by orthodox medicine and optometry are for the most part plastic and reversable. This knowledge is his heritage. It is for his inheritors to discover the processes that really cause visual disfunction, to use and improve on Bates' techniques, and to strive to develop new techniques for reversing these processes. This we are attempting to do at the Interscience Work Shop.

Part 2. Personal Experience

Having to wear glasses was a real blow to me as a child. I was a skinny, gangling boy of 9 when I was first required to wear them, precocious and aggressive intellectually but fearful and shy emotionally. I was tall for my age, and awkward and uncoordinated, especially in comparison with my classmates, who were usually a year or two older. I felt myself to be weak, unmasculine, a sissy, "out of it" with my peers. Glasses contributed greatly to my bad self-image. Only two decades later as a research psychologist did I discover how typical my pattern was for a myopic child, and that the myopia derives from the fearfulness and emotional withdrawal that precedes it and forms its base.

Not every nearsighted child has the determination I did to change myself, although many do. I pushed myself into athletics, and when I went into high school, into dancing classes, social events, and into dating. I became big, muscular, and more acceptable socially. Because of my intellectual aggressiveness, I was a leader of certain kinds of activities -- manager of the debate team, president of the Young Unitarians. But what I felt to be the "real me" under the muscular and verbal front remained a thin-skinned, easily embarrassed boy, hating the metal-framed glasses I was supposed to always wear but didn't, suffering agonies when a girl turned me down when I asked for a date or even a dance. And this "real me", I know now, formed the characterological base of my vision problem.

And my eyes got steadily worse. Once or twice a year I was sent to the ophthalmologist, and after duly peering through the pupils, expanded by drops, with his retinoscope, and running me through his trial lenses, his

"remedy" was always the same -- stronger glasses. One year I wasn't allowed to read or do close work, and spent my school hours in pottery, wood shop, and the like. It did nothing to keep my eyes from getting worse. In high school and after, they only got worse a little slower.

When I got out of the army at 23, I was able to barely read the largest letter on the eye chart at 20 feet with my better eye. My acuity was 20/200 in the left eye, 20/400 in the right, which means that an eye chart letter had to be 10 times as high for me to see it with my better eye as for a normal-sighted person. Glasses gave me 20/20 vision, but I still hated them, and had found that using them tended to make my eyes worse.

It was then that I read Aldous Huxley's book, THE ART OF SEEING, in which he described his experience with the Bates method, and the big improvements in vision near-sighted people had obtained through it. I contacted Mrs. Margaret Corbett, Huxley's Bates teacher, and the leading exponent of the method after Bates' death. Mrs. Corbett referred me to an instructor trained in her school, and I started Bates lessons, at first 3 times each week, 90 minutes each, with a daily homework program. Later I was dropped to two, finally to once per week.

I worked diligently, and my vision responded. In six months, the eyes that had for a lifetime only got worse became able to read 20/20 chart letters unaided and without squinting or other tricks, in virtually every lesson. These gains were temporary, but my basic test vision improved to 20/70 in the same period, with flashes of clear (20/20) vision at increasingly frequent intervals. By the end of two years I tested 20/40 under even unfavorable test conditions. I then passed my driving test without glasses, as I have done 8 or 10 times subsequently in four different states.

My vision has remained variable, and at times normal, but for the most part I have remained somewhat myopic. My optical correction to a consistent 20/20 had reduced to -1.25 diopters in each eye, where originally it was -2.75 in my better and -3.25 in my worse eye. It is difficult to get a precise refractive error figure on me, as my refractive condition varies substantially, even under cycloplegia, the drops in the eyes used by doctors to paralyze accommodation and expand the pupils.

I became a Bates enthusiast during my first year, and enrolled in Mrs. Corbett's teacher training program. After completing the course and qualifying as an instructor (which took a year of work), I practised as a Bates teacher and worked for my degree in psychology at the University of Hawaii. For more than two years Bates teaching was my primary occupation and means of livelihood. In those years and my year of training with Mrs. Corbett, I learned more about the causes and methods of improving common visual problems than even the most "advanced" orthodox practitioners in the vision sciences ever discover. This was still not enough to satisfy a fraction of the questions my practice raised.

My students improved substantially when they worked at it. Improvement was usually gratifyingly quick at the start, but then it slowed down. The factors that brought improvement were mostly psychological, and increasingly so as we worked. Bates' simple drills for relaxing, sunning, and mobilizing the eyes became more and more preparation and groundwork for the central problem in vision improvement, which was (as both Bates and Mrs. Corbett had taught) primarily psychological. I learned intuitively, by doing it, that when I could get my students' confidence, when I could

get them to relax emotionally, when I could get them to develop freedom from apprehension, from anger or suspicion, and from emotional pain, when I could get them to imagine pleasant scenes, their vision "turned on." Huxley spoke of "dynamic relaxation" as the state that allows vision to "turn on." What he (like Bates and Corbett) failed to emphasize sufficiently was the deep emotional roots of the tensions blocking this state of dynamic relaxation.

Because my understanding was intuitive and not yet conceptual, I struggled blindly for better techniques to bring vision to my students. The effort required with some students was prodigious. The nearsighted students (most of my students were nearsighted) were thin-skinned and vulnerable, and especially so when they opened up and their vision "turned on." Working with them -- especially those with higher degrees of myopia -- required me to "walk tip-toed on eggshells." When I could get myopic students to laugh, get them to trust, get them to expand, their lesson went beautifully; improvement from 20/100 to 20/20 or better during one lesson in my studio was not uncommon. But let me lift an eyebrow wrong, let the slightest trace of impatience or irritation creep into my voice, and there went my student's vision! It became a great strain to teach many of these students. When they called and cancelled a lesson, I felt such relief -- even though I needed the money to pay my rent.

Had I understood fully why it was such a strain, I could have coped more effectively, but I was operating on feeling. Neither Bates nor Corbett provided an adequate conceptual base for me to understand what was going on. I did not then realize that no such base existed anywhere, and I kept reading and searching, struggling after knowledge that did not exist. I soon

realized the need for research, and was drawn increasingly toward a career in research in the psychology of vision.

Perhaps the most eminent psychologist specializing in vision at that time was Professor Samuel Renshaw of Ohio State. Dr. Renshaw was the architect of the U.S. Navy's Aircraft Recognition Training Program of World War II. He was also the psychologist mainstay of the "Optometric Extension Program," a radical, psychologically-oriented group of optometrists. However, the most advanced thinker I could find on the emotional problems of the kind that I faced in my students was Wilhelm Reich. I resolved to learn what I could from both men.

After graduating from the University of Hawaii, I was accepted as a graduate student under Renshaw in the fall of 1949 and, after a college quarter, became a research assistant to him. I earned my master's degree under his direction the following year. Renshaw made a great deal of use of tachistoscopic techniques. Words, numbers, or patterns were employed that the student tried to reproduce from a flash (tachistoscopic) exposure of a twentieth of a second or less. This tachistoscopic training not only improved the recognition of visual form but, Renshaw observed, sometimes decreased myopia among students.

Working for Renshaw, I developed a means for generating random visual patterns of any desired level of difficulty for use in tachistoscopic training. I also learned the thoroughness, discipline and patience required of a good experimentalist, and I acquired a great amount of knowledge about the psychophysiology and the experimental psychology of visual perception. I became familiar with the optometric and medical as well as the psychological literature on vision. Nowhere was there anything that threw light on my experience with vision improvement

via the Bates method. Psychology, optometry and ophthalmology did not even recognize that such improvements took place, much less investigate how and why. Everyone among the orthodox was caught up with the study of mechanisms, and the mechanism of vision is exceedingly intricate and interesting. No-one was working with the emotional functions producing visual problems.

But Wilhelm Reich and his students were into the bodily basis of such emotional functions, and were employing powerful techniques of emotional release based on Reich's discoveries. I went to New York to study Reich, and to go into therapy with a doctor he had trained, while I worked for my Ph.D. In New York I took my first professional job as an applied experimental psychologist, and I enrolled as a doctoral student in the New School for Social Research.

My major professor at the New School was Dr. Hans Wallach, a fine experimental psychologist working in the area of visual perception. My doctoral dissertation under Dr. Wallach was entitled "Psychological factors in myopia." I investigated the medical and optometric theories of myopia, to be discussed later, and I studied research on the nature and correlates of myopia, both in the physiological and psychological realm. I went back over the improvement in vision of myopic students I had taught as a Bates teacher, on whom I had kept careful records. Most significant, I did an experimental study on the use of psychological techniques derived from the Bates method to improve myopia. Using optical instruments from the former School of Optometry at Columbia University, and working in the Optometric Center of New York, I showed conclusively that:

1. Myopia is not a fixed optical condition, but a plastic and variable one.

2. Large temporary improvements in myopia could be produced by the techniques derived from Bates.
3. The improvements were not due to improved interpretation of blur, contraction of the pupil, tears on the cornea, or to changes in shape of the lens (accommodation).
4. The changes were unaffected by cycloplegia (drops in the eyes).

There is a strong presumption from my data that the improvement in myopia of the experimental subjects was due to a change in the length of the eyeball as a result of action of the extrinsic muscles of the eye. Bates had said that myopia was due to contraction of these muscles. The implication of the study was also that permanent improvements in myopia should be possible using the techniques I had employed.

The study created a minor stir. It was awarded the Alumni prize as the finest dissertation of the university in the 1957-58 academic year. It was presented to the American Psychological Association convention, printed in a summary article in the Journal of the American Optometric Association, written up in Time magazine and the New York Times, recorded and broadcast over radio stations in New York and California. With that, interest died. Its effect on the vision professions has been nil. This carefully controlled research program has never had a fraction of the influence of, for example, the attack on Bates and his work by Martin Gardner in the book **FADS AND FALLACIES IN THE NAME OF SCIENCE**. Gardner had no educational or professional qualifications for discussing Bates, did no serious investigation of Bates' claims, and condemned out of hand Bates and those who reported deriving benefits from Bates' work. The article

was full of "authoritative" pseudo-scientific pronouncements, attacks on Bates' character, and gross and ignorant distortions of his scientific position. Gardner's attack on Bates and its widespread influence infuriated me. It is best described as an example of the pseudo-scientist urinating on his scientific betters. This practice is very safe; indeed, it is encouraged, as long as the victims are espousing an unorthodox position.

The attitude towards Bates' work generated by Gardner attack and others like it made it possible for the optometrists and medics of New York to band together to have the Bates method outlawed in New York State. I still get letters on occasion from people in New York wanting to know where they can get Bates training. Many of these correspondents are in desperate visual condition, and I know with certainty that Bates work could help some of them. I sometimes feel like writing them to go blind, courtesy of Martin Gardner and their local medical and optometric associations.

Despite my vindication of Bates' claims, techniques to change the underlying emotional factors in myopia and other visual disorders were still lacking. My dissertation provided no new methods of training, but only confirmed the effectiveness of some of those I had used as a Bates teacher. I could not, in my dissertation, go into the application to vision problems of the deep emotional release techniques of Wilhelm Reich. This was both because I was not ready, and because these techniques were too unorthodox and emotion-charged to be accepted then in even as open a university as the New School for Social Research.

But my experience in Reichian therapy confirmed that I was on the right track. My therapist was Dr. Wm. F.

Thorburn, an osteopath trained by Reich. My vision was much affected by the Reichian emotional release techniques he used, and in a different way than had occurred in Bates lessons. For example, when I learned to cry again with Dr. Thorburn's help, it freed my eyes and changed the quality of my visual experience. I had not cried for 20 years, and it "opened my eyes" in a very different sense than Bates lessons ever had.

On the way to and from Dr. Thorburn's office I passed the window of a large, well-arranged florist shop. After the appointment the colors and arrangements of these flowers appeared strikingly vivid, and affected me deeply. I would stop and gaze at them in a kind of wonder. The whole visual world was opened up to me in a new direct, intense form of visual perception. Other students in Reichian therapy reported experiences similar to mine. Some also reported lasting improvements in vision, and a few discarded glasses as a result of their Reichian work. The latter were exceptional cases.

What was needed was someone to put together Bates' and Reich's work in a new synthesis. I was the right person from the standpoint of knowledge, in fact, the only person who could, but I was not yet ready emotionally.

Dr. Thorburn died in 1960. I moved back to California in 1963. I was fortunate enough to find my way to Dr. Philip Curcuruto, who proved to be among the most skilled of Reichian practitioners I had met. (I had met many in a dozen years' association with the Reichian movement.) Even so, five more years of hard work were required for me to complete my Reichian analysis. This was 1968, then, 20 years after I first grasped the potential importance of Reich's techniques as a Bates teacher and undergraduate at the University of Hawaii.

But I was quite a different person characterologically. The deep myopic fearfulness was gone. Still intellectually aggressive, I was also much more open and spontaneous emotionally, confident in personal relations.

And I was twenty years older. I had been highly successful in my work as an applied experimental psychologist, and was now internationally known, with a book and scores of papers to my credit. My scientific work on vision had been limited to such things as studying optical information gathering on the Apollo mission, heads-up displays for Naval aircraft, motor vehicle rear vision systems, etc. Much of what I did didn't involve vision at all, and none of it vision improvement, as my scientific interests had expanded into other fields. My vision training skills had only been kept alive through the years by people who knew my background, and who came to me privately to learn what they could do for their own or their children's vision problems.

In 1967 and 68 my wife Erica and I laid plans for the first group of volunteer myopes to undergo a combination of Bates, Renshaw and Reich techniques aimed at improving their vision. The techniques we developed for the group were original, rooted in my understanding of these men's work, but brought together by us in a new synthesis. Bates and Renshaw techniques were modified to reflect my understanding of the deep emotional basis of visual dysfunction. Changing the student emotionally or characterologically to free him from the factors which generated his visual problem was our first concern. The specific vision improvement techniques then became important, so that the emotional change could be translated into improved vision.

Our first group of five volunteers met in our home

for twelve weeks starting in January 1969. It was techniques of emotional release rooted in the concepts of Reich to which we gave major emphasis. They worked. We reached deep levels of spontaneous emotional discharge in most sessions with most of our students, though it took up two of the three hours of each meeting, working with each student in turn, to do so. The specific vision techniques were less effective than they could have been due to lack of time. Renshaw tachistoscopic training needs at least 3 half-hour sessions per week, for example, and we had time for only 15 or 20 minutes in our 3-hour once-a-week group meetings.

Nonetheless, all of our students changed visually. The average 12 week improvement in vision was equivalent to two lines on the eye chart. But in assessing the significance of the experiment at the end of our twelve weeks of work, the students agreed that the emotional changes they went through were more significant to them than was the improved vision. (One student said they were "equally significant.") And all agreed that the changes were deeply significant. We really didn't have to ask; we could see them happen as we worked.

Since that time, those students who continued to work have continued to improve. One originally highly myopic student has reduced her optical correction by 3/4. A less myopic student has now brought his test vision up to 20/20. Optometrists confirm our students' improvements.

And so in November 1970 the Interscience Work Shop opened its doors. As of this writing, half a year later, its vision improvement program has only begun to attract students. But for those students who have come, the program is proving its power. The Interscience Work

Shop classes, workshops and individual instruction in vision improvement have the potential for becoming the most effective program for the improvement of vision that has ever been offered. The program is new, however, and there is so much to learn that we feel we are only beginning.

One of our problems is that over the years my own interests have expanded to areas other than vision improvement, i.e., "education in feeling and purpose" (Kelley, 1970). This has meant that the vision program moves more slowly than it would were it my sole concern. But an effective new teacher, our first, has been trained to use the techniques, and others will follow. We now offer regular classes in vision improvement as well as individual instruction. The techniques evolve further each week. We hope, within no more than a few years, to be able to obtain support for a properly controlled experimental study of the effects of our vision improvement techniques on a range of vision problems, from myopia and hyperopia to cataract, glaucoma and other major causes of blindness.

Part 3. Myopia and Hyperopia

Myopia (nearsightedness) is a condition in which the eyeball is too long relative to the strength of the eye's optical elements (cornea and lens). The image of distant objects is focussed in front of the myope's retina, and a negative (diverging) lens, thin in the middle and thick at the edges, must be placed in front of the eye to bring the plane of focus back to the retina. Myopes of any degree suffer very poor distant vision -- worse than most people realize. It is not unusual for the myope to be unable to read the largest letter on a standard eye chart at 20 feet without glasses, and many must approach to 2-6 feet of the chart to distinguish its largest letter.

Hyperopia or hypermetropia (farsightedness) is the opposite condition to myopia, for in it the eyeball is too short relative to the eye's optical elements. When the hyperopic eye relaxes, the image of distant objects is focussed on a plane behind the retina. A positive (converging or magnifying) lens, thick in the middle and thin at the edges, is required to bring the plane of focus forward to the retina. It is more difficult to detect hyperopia than myopia, because the eye can increase its own focussing power by accommodation. Accommodation is the function that makes it possible for the normal eye to adjust itself to see nearby objects clearly through an increase in the thickness of the lens of the eye. (The myope cannot accommodate in reverse to see distant objects more clearly.) If the hyperopic eye accommodates an amount just equal to the amount of hyperopia, the lens thickens enough that distant objects will be focussed onto the retina, and so seen clearly. Nearby objects can also be seen clearly as long as there is enough additional accommodation present to adjust the eye for the closeness of the objects viewed. The hyperopic lens must thus

thicken more to see near objects than does the lens of the normal eye.

Whereas the typical myope is most bothered by the blurring of his distant vision, the typical hyperope is bothered by eye strain or fatigue, difficulty in concentrating for long on near-point work, problems in focussing the eyes, and by the tendency for print (and other objects viewed at near point) to blur at an earlier age than they do for others. Hyperopes are far more subject than myopes to eye headaches, crossed eyes, and reading difficulties. Small degrees of hyperopia are common, especially with young children, but among adolescents and adults, large degrees of hyperopia are not nearly as common as large degrees of myopia. Much more has therefore been written about possible causes of myopia than of hyperopia.

Perhaps the four most widely held theories of myopia causation (the first and last of which are also theories of hyperopia causation) are:

1. Genetic theory -- myopia and hyperopia are inherited conditions.
2. Nutritional theory -- myopia is a product of diet.
3. Conditions of use theory -- myopia is the result of the excessive use of eyes for near-point tasks.
4. Normal biological variation theory -- myopia and hyperopia are, in most cases, only the reflection of normal variation in the length of the eyeball and the strength of the eye's optical elements.

The evidence against each one of these theories is substantial. I have reviewed it in detail elsewhere (Kelley 1958) and will only summarize the main points here.

Genetic Theory

The belief that myopia (and hyperopia) is inherited does not hold up to scientific examination. True, myopia tends to run in families, but this is true of a great many acquired conditions and behaviors. The best studies of human inheritance are of identical twins, since only such twins have identical inheritance. Studies of twins by Hofstetter and Rife (1953) and Meyer-Schwickerath (1949) show that identical twins don't have the closely similar degrees of myopia that the genetic theory demands. Population genetics based on correlations of refractive error and other body measurements in a study of a great many families confirm this conclusion, making it ...

... highly unlikely that static refractive error (myopia and hyperopia) is primarily hereditarily determined. (Young, 1958)

The best that can be said of the role of inheritance in myopia and hyperopia is that some people may be especially prone to these conditions due to constitutional factors (Henderson, 1934). It is quite possible that there are inherited constitutional differences that make some individuals more or less susceptible than others when they are exposed to the factors which cause these disorders of sight.

Nutritional Theory

The nutritional theory of myopia is that dietary deficiency or imbalance affects the eye's structure in

such a way that myopic elongation occurs. The great differences in myopia incidence between cultures might be accounted for in this way, e.g., the notoriously poor diets and high myopia incidence in the orient. The fact that first generation American children of European parents have an incidence of myopia like that of other Americans rather than like that of the country of their parent (Nadell and Hirsch, 1955) is also evidence against a genetic and for a nutritional or other environmental theory. However, studies of the diets of myopes have not shown consistent dietary differences between myopes and non-myopes living in the same culture that could explain myopia. The incidence of myopia is higher among the well fed professional segment of the population than among the badly fed poor, for example.

There is one interesting fact that has emerged from research on dietary factors related to myopia. Young myopes tend to have depressed blood calcium compared with controls (Wood, 1927; Law, 1934). There is no evidence that this is due to their diets, however, nor that administration of calcium and vitamins (Knapp, 1939; Stansbury, 1948) arrests the progress of myopia.

Conditions of Use Theory

There is a close correlation of myopia incidence with the conditions of civilized life, which includes such a great increase in use of the eyes for near-point work. In civilized countries, school work alone results in an extremely large added use of the eyes at reading distance during the childhood years in which most myopia develops. The occurrence of myopia is low among pre-school children and increases tremendously in the school years. It continues to increase in association with education from grammar school

through professional schools. Too, myopia has a lower incidence among peasants, farmers, and primitive people than among the highly educated professional classes.

Any adequate theory of myopia must account for these facts. Simplistic explanations quickly run aground, however. Thus while it is true that myopic children tend to read more than others (Young, 1955) it does not follow that the reading causes the myopia. More than average reading could be a result of the myopia, for example, or both myopia and the tendency to read a lot could be the consequence of a third factor. This factor could be, e.g., a type of over-all character or personality development that is associated with both myopia and a predelection for reading. In point of fact, there are dozens of studies, spread over 70 years, to show that severe curbs on reading, use of large type, strict control of lighting, etc. etc., does nothing whatever to reduce the incidence or slow the progress of myopia. Vision hygiene programs have failed repeatedly as myopia preventatives. Occasional positive results have been reported, but have not held up under massive and repeated investigation. The conditions of use theory of myopia, attractive as it is on many counts, has failed to prove its case (Nadell, et al., 1957; Stansbury, 1948).

Biological Variation Theory

Yet another theory of myopia and hyperopia, somewhat akin to the genetic theory, holds that hyperopia and most myopia is the result of normal biological variation in the eye's structure (e.g., Sorsby, 1934). The theory holds that just as some people are much taller or shorter than others, or have longer arms and fingers, some people have longer eyeballs or shorter eyeballs relative to the strength of the eye's optical elements. In this

view, if your eyeball happens to be too long, you are myopic; if it is too short, you are hyperopic.

This theory is refuted by two lines of evidence. First, the myopic eye follows an entirely different pattern of development from the normal eye. The normal-sighted child stays normal while the usual myopic child at age 8-12 becomes progressively more myopic, often changing markedly in a few years (Hofstetter, 1954). This means that something is happening in the myopic eye that is decidedly not merely normal biological development.

More technical but equally telling is a statistical point. Body dimensions that are subject to normal biological variation, such as height, leg and finger length, etc., are distributed in the population at large according to a "normal distribution curve," with most people at the center or average value, and decreasing numbers the further away from average one goes. The exact mathematical nature of this curve is well known, having been discovered by Gauss over a century and a half ago. Eye measurements (refractive error) conform to the normal distribution curve early in life, but their distribution becomes increasingly abnormal over time (Wibaut, 1926; Hofstetter, 1954). The adult curve of refractive error in the population bears little resemblance to the normal distribution curve.

Figure 3 shows one such curve for a large sample of adult male Americans, together with a best fitting normal curve. Two major changes have taken place to distort the shape of the actual refractive error distribution from the "expected" normal shape:

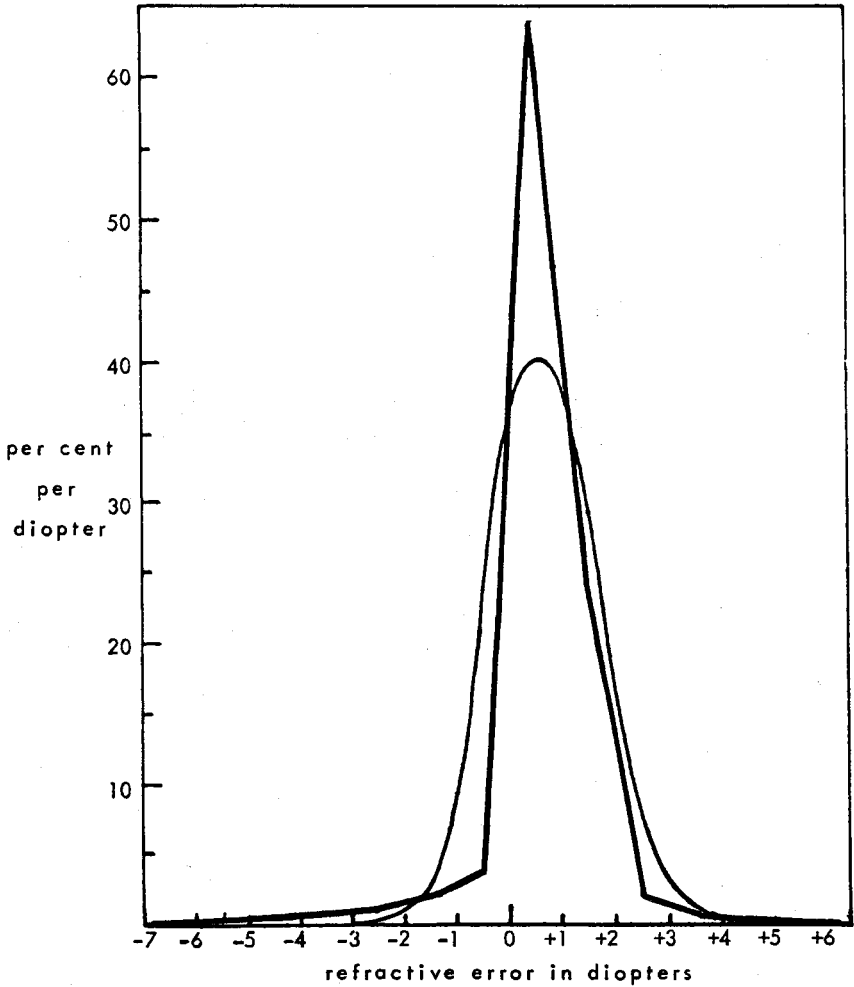


Figure 3. Frequency curve of refractive error among adult male Americans (thick line) and best fitting normal curve (thin line). (From Stenstrom's treatment of original data by Stromberg; Stenstrom, 1948, p. 31.)

1. Cases are stacked up in the central (normal vision) portion of the curve ("leptokurtosis"). This indicates that the eye has a means of correcting at least small errors in refraction towards normal.
2. The curve is very skewed in the negative (myopic) direction, showing that a large minority of the population has become myopic.

There is nothing in these data to support the theory that myopia is a "normal biological variation."

The Mechanism of Myopia and Hyperopia

Stenstrom (1948) showed that variations in adult refractive error are almost entirely the result of differences in elongation of the eye. The two tendencies distorting the original normal shape of the curve of refractive error are thus due to a factor that affects the relative length of the eyeball. Bates believed, and the evidence from my own studies of myopia confirm, that this factor is the extrinsic muscles of the eye. Bates' research indicated that the two oblique muscles belting the eye around the middle were responsible for lengthening the eye, and, if they were chronically tense, they produced myopia. Opposed to the action of the obliques, he held, were the four recti, extending from front to back of the eye. These, according to Bates, flattened the eye and, if chronically tense, produced hyperopia.

Bates believed that these same opposed muscle groups were responsible for accommodation of the eye, the obliques lengthening the eye for near vision, the recti flattening it for the distant view. There is substantial evidence that this is not the case and that the eye instead accommodates by action of muscles within the

eye which change the shape of the lens (Helmholtz theory).

The incorrectness of Bates' theory of accommodation says nothing about the validity of his theory of refractive error. Since there appear to be two mechanisms affecting the refractive condition of the eye, one internal and one external to the eyeball, it was natural for Bates, discovering one of these mechanisms, to generalize that it also performed the second (accommodative) function. Other vision scientists have frequently made the converse error, trying to explain most myopia in terms of the accommodative mechanism within the eyeball. A special x-ray technique for measuring eyeball length had to be developed before it was established that the mechanism of myopia was, instead, eyeball elongation (Stenstrom, 1948).

Dynamics of Myopia and Hyperopia

Myopia and hyperopia are due, then, to relative elongation or flattening of the eye by the extrinsic muscles. Yet this refers only to the mechanism of refractive error, and not the underlying cause. The elongation of the eye in the direction of myopia by the oblique muscles is a kind of flexor action; the opposed direction, flattening the eye in the direction of hyperopia by the recti, is a kind of extension. This identification of a direction inward or outward is an indicator of the nature of myopia and hyperopia that is consistent with a Reichian body energy concept. In myopia the direction is inward, contractive, toward the self. Hyperopia is the reverse, i.e., outward, expansive, away from the self.

Several psychological studies of myopia and a few

of hyperopia show that there are character and personality traits associated with these conditions (e.g., Young, 1967; Rosanes, 1966). Studies prior to 1958 have been reviewed elsewhere (Kelley, 1958). Table 1 summarizes important differences between myopes and hyperopes. These are generally consistent with the research literature, but go beyond it. The findings on body structure and function are (except for the first two) based on my own experience in vision improvement work.

Generalizations about the body and character dynamics of myopes and hyperopes must be made with due respect for the individual development process. The tendencies described in Table 1 refer to early, deep dynamic factors that are reacted to in many different ways. Some myopes remain shy, withdrawn, seclusive, and sedentary all their lives, for example, while others "take themselves in hand" -- often in adolescence -- and force themselves to compensate. They may then go into athletics and/or social activities, for example. The myopic gymnast, weight lifter or football player, in my experience, has usually started into athletics to compensate for his deep underlying fearfulness, working to erase the suspicion that he is a "sissy". As a result of his compensation, his superficial appearance may contradict features of the description of Table 1. And virtually every student coming in for training has armored against, not just one basic emotion, but all of them. Thus some degree of blocked grief, rage and fear show themselves in myope and hyperope alike. Some of these blocks are later and more superficial than others. With the myope the early, deep fundamental block is of fear; it is often necessary to peel away shallower layers of armoring to reach this level. With the hyperope, however, the anger block is fundamental, and his deep rage must ultimately be reached and released, whatever surface layers may cover it.

Table 1

Tendencies often found in myopes versus hyperopes.

Myope

Hyperope

Character and Personality

inward, introjective, self-oriented

outward, "other" oriented

shy, withdrawn as a child

aggressive as a child

"good" in school

often a behavior problem in school

childhood "temper tantrums" rare

childhood "temper tantrums" common

stubborn, emotionally inflexible

more yielding to external pressure

more at home with self, uncomfortable with others

more at home with others, uncomfortable with self

often "off" in day dreams, subvocal thought

alert, aware of environment

comfortable with eyes closed; retreats from visual perception inward

uncomfortable with eyes closed; retreats from the self outward

Body Structure and Function

underactive, often sedentary
body soft, sometimes flabby

throat, high chest, jaws, back of neck, scalp
-- chronically tense; jaw rotated forward,
forehead back; shoulders forward

disconnected from feet; "up in the head;"
centered but poorly grounded

voice often breathy or husky; becomes hoarse
easily

chest often depressed; breathing blocks on
inspiration
fearful; blocking terror

usually large-looking, open; very little local
armorings around eyes

squint, fusion problems not common
unusual to have pain, eye headache
eyes lack sparkle, brightness
eyes look down or away in anger.

hyperactive

body tense, hard, wiry

eyes, side of neck, back -- chronically
tense; forehead rotated forward, chin
back; shoulders back

better grounded, but less well centered;
"out into the muscles"

voice more often clear

chest often expanded; breathing blocks on
expiration
angry; blocking rage

usually smaller-appearing; much local
armorings around eyes

squint, fusion problems frequent
pain, headache common
eyes bright
eyes spark, look at one in anger.

Eyes

Some of the behavioral observations that Table 1 is based on (aside from those of body structure) may help show how this understanding of myopia and hyperopia was reached. In the build-up of strong emotion that develops while using neo-Reichian techniques of emotional release, certain students develop an almost uncontrollable tendency to close their eyes, often clenching them tight despite repeated instruction to open them. It is clear from their timing and manner that this is a fear response, a frightened shutting off of the visual world. (The eyes will also close in grief, but the student has no trouble opening them if so instructed.) I have witnessed this fearful eye-closing reaction hundreds of times, yet it is only myopes who do it; I have very rarely taught a hyperope that reacted in this way.

If the hyperope is instructed to close his eyes, it rouses anxiety; his natural tendency is to keep his eyes open as his feelings build. For this reason it is often difficult to teach a hyperope to palm successfully, i.e., to close the eyes and cover them with the palms in the way Bates recommends. The instant either the student himself or his vision teacher speaks, the hyperopic student tends to take down the palms, open the eyes, and look at the teacher. -- Yet I've never known a myope to do this.

In a workshop full of myopes, the teacher must continually work to keep the group in motion. When not carrying out drills or instructions, the myope tends to stop activity, to sit, lie down, or just stand, but in any event, to become inert. In a group of hyperopes, the usual problem is to get the students to shut up, be still, and pay attention enough that instruction can proceed! These facts, known, I think, by every Bates teacher, were confirmed in the doctoral research of Rosanes

(1966), which showed that hyperopes express anxiety by increased motor activity, myopes by decreased motor activity.

When a compensatory posture has not obscured it, the basically fearful body expression of the myope is clearly evident. The shoulders are held forward and often dropped, the chest deflated. The skull is rotated chin forward-forehead back, as if a blow were expected. The flexors at the back of the neck, a key point in the myope's body armor, are primarily responsible for the myope's typical neck posture (see Figure 4). They pull the head back and into the torso. The throat is highly energized, blocking and holding against the fear. Inner thinking with sub-vocalization is common, and helps keep the myope "in his head." The forehead tends to be smooth and pulled back by the tense scalp, the eyes opened wide, but with a certain deadness of expression. The eyes of the myope lack sparkle and life, and pull back from contact, even as they look at you.

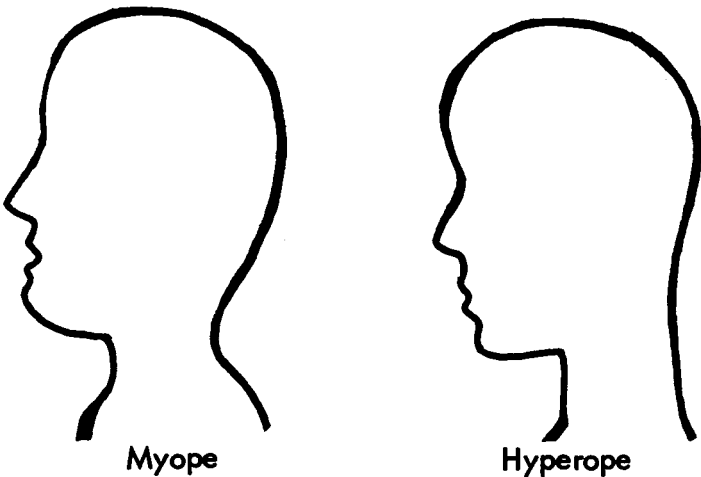


Figure 4. Typical myopic and hyperopic head posture.

The hyperopic posture is stiff, expressing the held-in anger. The shoulders are often pulled up, the chest held full and high. The skull is rotated forehead forward-chin back, making the head stiff and tall. The tense muscles at the side of the neck tilt the head forward, and also prevent the head from turning easily from side to side. There are often heavy tensions in the brows, lids and extrinsic eye muscles, and the eyes themselves may appear small because of the armoring around them. The extra-ocular muscle tension causes a tendency to stare, and interferes with coordinated binocular eye movements. For all this eye armoring, the eyes of the hyperope are usually bright and lively in expression compared with those of the myope. The eyes will flash in anger, which myopic eyes do not do, and eye contact is usually sought. There may be less energy and holding in throat, mouth and jaw than with the myope, however. The thought processes of the hyperope are frequently visual rather than sub-vocal. He is less often off "in his head," but is frequently scattered and away from his center, i.e., his body energy drives outward from his visceral core into his muscles.

The basic energy picture of the hyperope is of energy expansion from the center to periphery, into the limbs, down to the feet, and up through the back of the neck, over and through the top of the head, projecting through the eyes and out onto the environment. The block limits the contractive phase of the pulsation, back into the center, so the hyperope is stuck and holds on the expansive phase, the chest high and filled. The visual region of the brain is at the back of the head, and the expansive flow is directed through this region to the eyes. Visual problems develop in association with the ocular armoring around

the eyes which develops to limit and contain the strong forward ocular flow of energy.

The basic energy picture of the myope is of energy contraction from the periphery to the center. There are particular blocks to expansion which limit the flow of energy from the body's visceral core through the genital and pelvic area below, and the top of the chest and neck above. The chest is usually depressed and holds against full inhalation. There is a fundamental block at the back of the neck and head, extending over the scalp. Picture the posture and expression of a child in chronic fear of a parent or teacher. The ocular flow itself is much weakened, and energy flows strongly instead into the throat and jaws, often with heavy sub-vocal thinking. In addition to the obvious head and neck posture, the pelvis is held, usually forward. The testicles are lifted in the male, the buttocks pulled in, and the genital, perineal and anal area contracted in both sexes. The basic armor of the myope, then, is not ocular, but it blocks the ocular flow of energy before it reaches the eyes, and even before it reaches the visual region of the brain at the back of the head.

Although the myopic posture is fearful, it is not often yielding or acquiescent. There is stubbornness and determination expressed in the stiff neck and tense jaw. It expresses a layer of anger present in most myopes that must be freed before the more fundamental fearfulness becomes accessible. Occasionally an "angry" myope is found, with a high stiff chest. This anger is superficial, easily accessible compared with the deep fear underneath.

Part 4. The Improvement of Vision

The medical and optometric professions have had some success in improving the vision of myopes, -- more, in fact, than many of the most respected men in the field have acknowledged. This is doubtless because orthodox doctrine is that little genuine improvement in sight without glasses can occur with most people having defective vision, and doctrine is often more important to conservative practitioners than well-documented experimental results by the more venturesome members of the professions dealing with vision.

Table 2 presents example data from a few studies of myopia improvement. To make the data from all studies comparable, I have presented the results in terms of how large the smallest visual acuity test targets were which were read correctly after training, expressed as a per cent of the size (area) of the smallest read before training, both tests being made without glasses, of course. An improvement from 20/40 to 20/20 or from 20/100 to 20/50 would both be classed as 25 per cent, since the smaller targets seen "after" have 1/4 the area of those seen "before" in both cases. In the group training experiment of Berens and his co-authors, who employed 30 sessions of Renshaw tachistoscopic techniques, an improvement to about 35% of initial target size was found, about four lines improvement on the test chart used (Berens, et al., 1957). This substantial average improvement was for a group of 80 subjects, and was published in the prestigious American Journal of Ophthalmology. The authors are a team of four investigators of repute, three MD's and a psychologist. A control group of 60 subjects failed to improve, as would be expected without the training.

Table 2

Effectiveness of visual improvement techniques in myopia; a summary of experimental studies.

<u>Reference</u>	<u>Area of targets seen after training as a percentage of the smallest seen before training</u>	<u>Improvement ratio (approx.)</u>
Optometric group training methods:		
Hildreth, <u>et al.</u> , 1947	70%	1.5
Woods, 1946	50%	2.0
Tachistoscopic training:		
Berens, <u>et al.</u> , 1957	35%	3.0
Experimental suggestion:		
Fox, 1959	25%	4.0
Kelley, 1958	20%	5.0
Extensive individual Bates training: (four subjects trained 50-200 hours each)		
Kelley, 1958	less than 2%	50.0

Other techniques bring even greater improvement, as the studies cited confirm. The results of extended Bates training show that the improvements in visual acuity demonstrated in relatively brief group experiments could be greatly extended by prolonged individual Bates training. Part 1 of this article showed that comparable improvements in other visual functions occur with conditions other than myopia as a result of long continued Bates training.

It is not yet possible to present data comparing the results of the Interscience Work Shop's new techniques with the results of prior studies. The techniques are too new, and as yet we lack resources necessary for properly controlled experimental research. But the results are striking. Students are improving their vision, some dramatically, and in most cases more quickly than by use of any other techniques with which I am familiar. We expect to be able to demonstrate improvements greater than are possible with the Bates method, both in rate of improvement and final level reached through training. We expect also to show some major improvements in very serious visual conditions, but we want to avoid building anyone's hopes unduly. We give training experimentally to some applicants with severe vision problems when their condition is not communicable, making certain they understand that we can promise nothing. We ask that they have their eye doctor monitor their progress. We will report our results in these cases, failures and successes alike.

Vision and Feeling

The most important changes taking place in most students are not in vision itself, however, but in the

whole person, at the feeling level. When a person has been haunted unconsciously since childhood with the effects of blocked fear, rage, or grief, the release of the blocked emotion brings changes that are usually much more significant to him than the improved vision in itself.

The release of blocked fear brings a freedom and opening out of the student that changes his being profoundly. The deflated chest fills, the posture straightens, and the student faces his life with new confidence. He is better able to express anger or love, both of which were held by the fear block. The voice drops in pitch and becomes more resonant as the throat -- which, like the eyes, plays a key role in the fear block -- relaxes. Genital tensions relax and the sexual experience deepens. -- And the vision improves! There is no experience as significant for bringing vision improvement to the myope as the release of blocked fear.

Similar things can be said about freeing the blocked rage that typifies hyperopia. There is a relaxation and often a lightening of the personality, an opening and brightening, with a new sense of freedom. Frequently there is an outpouring of joy following a particular release session. The head turns more easily as tensions in the back, shoulders and the sides of the neck give way. Perhaps most significant in the long-term view, however, is a centering of the person, a coming in to himself, a focussing of his vital energy. The person blocking anger has his energy scattered in the periphery, in his muscular system. Release of the anger block permits the energy to flow back to the center, the body's visceral and plasmatic core. There is a corresponding reduction in peripheral muscle tension. The stiff expanded chest softens and drops. The eyes become softer, opening wider and moving more freely

as the local armoring around them disappears. Headaches, double vision, imbalances and incoordinations in the two eyes greatly improve, especially if vision drills to take advantage of the changes are practised.

When it is grief that has been blocked, release of the block results in full and free crying, with no holding back of sound. The freeing of the high chest, throat, jaw, pharynx and eyes as well as the high chest is involved. There is frequently an admixture of fear or rage in crying, in which case the crying will be partial, and may turn into a rage or fear discharge. The "purest" release of grief does not involve fear or rage, however, but very deep hurt or disappointment that was blocked out of awareness by the armor. Release then results in agonizing sobs and cries from the depths of the being.

The release of grief affects vision significantly. Crying is a discharge of energy through the throat, mouth, nose and the eyes. The lids typically close tight at the peak of a grief discharge, as if to contain the strong outpouring of energy through the eyes. The high chest heaves convulsively, the upper face turns red, and the tears and sounds pour out with full involuntary expirations. After the discharge the eyes are temporarily puffy and red. Emotionally, there is a relief and calm, with an integration of the deep feelings. The expression is serious and open. Eye contact is unusually intense and direct, and the visual surroundings are experienced with unusual vividness. Things of beauty affect the student deeply. He is sensitized, not only to colors and forms, but to emotional expressions. He is strongly aware of where other people are, including their blocks and inhibitions to feeling.

When the opening is sudden and new, the ex-

pressions of many people are a shock. People on the street can appear grotesque and agonized. "To see" in our sense of the word means to become aware of what is there, be it lovely or unlovely.

The release and spontaneous discharge of fear, rage, and grief are central to our vision improvement work, as to our "education in feeling" program. People ask about the positive emotions: Do we not free them also? -- What we free is what is present within the student, of course. Most people must work through negative emotion before reaching the positive. Approaches which endeavor to create joy without first working through pain are of necessity superficial, for no deeply joyous experience is possible when deep fear, rage, or grief is blocked and held in.

And the primary positive emotions are but the "other side of the coin," polar opposites of the negative, i.e.,

pain	←→	pleasure
fear	←→	trust, receptivity, openness
rage	←→	joy, love
grief	←→	mirth, humor

To block a negative emotion from awareness results in blocking the positive that is its polar opposite. To free the one opens the capacity for the other.

The freeing and discharge of feeling is the ground on which our vision improvement work takes place. Opening the feelings does not in itself guarantee measurable changes in vision, though they do occur. Its main function is to make the student much more accessible to

specific vision improvement techniques, such as those derived from Bates and from Renshaw.

Our vision improvement work thus includes these four classes of techniques:

1. Neo-Reichian emotional release work, including the Interscience Intensive, for freeing blocks to feeling that affect vision. This is the core of our program.
2. Lowen stress positions and other bioenergetic drills to mobilize the body's energy.
3. Bates vision improvement drills.
4. Renshaw tachistoscopic training, the flashing of visual patterns for a fraction of a second, to be observed and reproduced by the student.

In addition, we are developing some new feeling-oriented vision improvement drills, which we hope will prove of real value. The Bates drills are described in Part 1 of this article, and our neo-Reichian techniques for the freeing of feeling in Kelley (1970). Our program began as a blending of these.

Our techniques will doubtless change considerably in the years ahead. It is well to remember how young our approach is. It has been less than three years since the first small group of myopes volunteered to undergo a mixture of Bates and Reichian techniques. This was the inception of our program. Our facility for teaching this work has, of this writing (September 1970) been open less than a year. It has, we believe, been a truly significant year for understanding the nature of, and developing techniques to improve, the major disorders of sight.

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