= Bates method =

The Bates method is an alternative therapy aimed at improving eyesight . Eye @-@ care physician William Horatio Bates , M.D. (1860 ? 1931) attributed nearly all sight problems to habitual strain of the eyes , and felt that glasses were harmful and never necessary . Bates self @-@ published a book , Perfect Sight Without Glasses , as well as a magazine , Better Eyesight Magazine , (and earlier collaborated with Bernarr MacFadden on a correspondence course) detailing his approach to helping people relax such " strain " , and thus , he claimed , improve their sight . His techniques centered on visualization and movement . He placed particular emphasis on imagining black letters and marks , and the movement of such . He also felt that exposing the eyes to sunlight would help alleviate the " strain " .

Despite continued anecdotal reports of successful results , including well @-@ publicised support by Aldous Huxley , Bates ' techniques have not been objectively shown to improve eyesight . His main physiological proposition ? that the eyeball changes shape to maintain focus ? has consistently been contradicted by observation . In 1952 , optometry professor Elwin Marg wrote of Bates , " Most of his claims and almost all of his theories have been considered false by practically all visual scientists . " Marg concluded that the Bates method owed its popularity largely to " flashes of clear vision " experienced by many who followed it . Such occurrences have since been explained as a contact lens @-@ like effect of moisture on the eye , or a flattening of the lens by the ciliary muscles .

The Bates method has been criticized not only because there is no good evidence it works , but also because it can have negative consequences for those who attempt to follow it : they might damage their eyes through overexposure of their eyes to sunlight , put themselves and others at risk by not wearing their corrective lenses while driving , or neglect conventional eye care , possibly allowing serious conditions to develop .

= = Underlying concepts = =

= = = Accommodation = = =

Accommodation is the process by which the eye increases optical power to maintain focus on the retina while shifting its gaze to a closer point . The long @-@ standing medical consensus is that this is accomplished by action of the ciliary muscle , a muscle within the eye , which adjusts the curvature of the eye 's crystalline lens . This explanation is based in the observed effect of atropine temporarily preventing accommodation when applied to the ciliary muscle , as well as images reflected on the crystalline lens becoming smaller as the eye shifts focus to a closer point , indicating a change in the lens ' shape . Bates rejected this explanation , and in his 1920 book presented photographs that he said showed that the image remained the same size even as the eye shifted focus , concluding from this that the lens was not a factor in accommodation . However , optometrist Philip Pollack in a 1956 work characterized these photographs as " so blurred that it is impossible to tell whether one image is larger than the other " , in contrast to later photographs that clearly showed a change in the size of the reflected images , just as had been observed since the late nineteenth century .

Bates adhered to a different explanation of accommodation that had already been generally disregarded by the medical community of his time . Bates ' model had the muscles surrounding the eyeball controlling its focus . In addition to their known function of turning the eye , Bates maintained , they also affect its shape , elongating the eyeball to focus at the near @-@ point or shortening it to focus at a distance . Commenting on this hypothesis in an interview with WebMD , ophthalmologist Richard E. Bensinger stated " When we put drops in the eye to dilate the pupil , they paralyze the focusing muscles . The evidence of the anatomical fallacy is that you can 't focus , but your eye can move up and down , left and right . The notion that external muscles affect focusing is totally wrong . " Science author John Grant writes that many animals , such as fishes , accommodate by elongation

of the eyeball , " it 's just that humans aren 't one of those animals . "
Laboratory tests have shown that the human eyeball is far too rigid to spontaneously change shape to a degree that would be necessary to accomplish what Bates described . Exceedingly small changes in axial length of the eyeball (18 @.@ 6 ? 19 @.@ 2 micrometres) are caused by the action of the ciliary muscle during accommodation . However , these changes are far too small to account for the necessary changes in focus , producing changes of only ? 0 @.@ 036 dioptres .

= = = Causes of sight problems = = =

Medical professionals characterize refractive errors such as nearsightedness , farsightedness , astigmatism , and presbyopia (the age @-@ related blurring of near @-@ point vision) as consequences of the eye 's shape and other basic anatomy , which there is no evidence that any exercise can alter . Bates , however , believed that these conditions are caused by tension of the muscles surrounding the eyeball , which he believed prevents the eyeball from sufficiently changing shape (per his explanation of accommodation) when gaze is shifted nearer or farther . Bates characterized this supposed muscular tension as the consequence of a " mental strain " to see , the relief of which he claimed would instantly improve sight . He also linked disturbances in the circulation of blood , which he said is " very largely influenced by thought " , not only to refractive errors but also to double vision , crossed @-@ eye , lazy eye , and to more serious eye conditions such as cataracts and glaucoma . His therapies were based on these assumptions .
Bates felt that corrective lenses , which he characterized as " eye crutches " , are an impediment to curing poor vision . In his view , " strain " would increase as the eyes adjust to the correction in front of them . He thus recommended that glasses be discarded by anyone applying his method .

= = Treatments = =

In his writings , Bates discussed several techniques that he claimed helped patients to improve their sight . He wrote " The ways in which people strain to see are infinite , and the methods used to relieve the strain must be almost equally varied , " emphasizing that no single approach would work for everyone . His techniques were all designed to help disassociate this " strain " from seeing and thereby achieve " central fixation " , or seeing what is in the central point of vision without staring . He asserted that " all errors of refraction and all functional disturbances of the eye disappear when it sees by central fixation " and that other conditions were often relieved as well .

= = = Palming = = =

Bates suggested closing the eyes for minutes at a time to help bring about relaxation . He asserted that the relaxation could be deepened in most cases by " palming " , or covering the closed eyes with the palms of the hands , without putting pressure on the eyeballs . If the covered eyes did not strain , he said , they would see " a field so black that it is impossible to remember , imagine , or see anything blacker " , since light was excluded by the palms . However , he reported that some of his patients experienced " illusions of lights and colors " sometimes amounting to " kaleidoscopic appearances " as they " palmed " , occurrences he attributed to his ubiquitous " strain " and that he claimed disappeared when one truly relaxed . This phenomenon , however , was almost certainly caused by Eigengrau or " dark light " . In fact , even in conditions of perfect darkness , as inside a cave , neurons at every level of the visual system produce random background activity that is interpreted by the brain as patterns of light and color .

= = = Visualization = = =

Bates placed importance on mental images , as he felt relaxation was the key to clarity of imagination as well as of actual sight . He claimed that one 's poise could be gauged by the visual memory of black ; that the darker it appeared in the mind , and the smaller the area of black that

could be imagined , the more relaxed one was at the moment . He recommended that patients think of the top letter from an eye chart and then visualize progressively smaller black letters , and eventually a period or comma . But he emphasized his view that the clear visual memory of black " cannot be attained by any sort of effort " , stating that " the memory is not the cause of the relaxation , but must be preceded by it , " and cautioned against " concentrating " on black , as he regarded an attempt to " think of one thing only " as a strain .

While Bates preferred to have patients imagine something black , he also reported that some found objects of other colors easiest to visualize , and thus were benefited most by remembering those , because , he asserted , " the memory can never be perfect unless it is easy . " Skeptics reason that the only benefit to eyesight gained from such techniques is itself imagined , and point out that familiar objects , including letters on an eye chart , can be recognized even when they appear less than clear .

= = = Movement = = =

He thought that the manner of eye movement affected the sight . He suggested " shifting " , or moving the eyes back and forth to get an illusion of objects " swinging " in the opposite direction . He believed that the smaller the area over which the " swing " was experienced , the greater was the benefit to sight . He also indicated that it was usually helpful to close the eyes and imagine something " swinging " . By alternating actual and mental shifting over an image , Bates wrote , many patients were quickly able to shorten the " shift " to a point where they could " conceive and swing a letter the size of a period in a newspaper " . One who mastered this would attain the " universal swing " , Bates believed .

Perhaps finding Bates ' concepts of " shifting " and " swinging " too complicated , some proponents of vision improvement , such as Bernarr Macfadden , suggested simply moving the eyes up and down , from side to side , and shifting one 's gaze between a near @-@ point and a far @-@ point .

= = = Sunning = = =

Bates believed that the eyes were benefited by exposure to sunlight . He stated that " persons with normal sight can look directly at the sun , or at the strongest artificial light , without injury or discomfort , " and gave several examples of patients ' vision purportedly improving after sungazing ? this is at variance with the well @-@ known risk of eye damage that can result from direct sunlight observation .

Bates cautioned that , just as one should not attempt to run a marathon without training , one should not immediately look directly at the sun , but he suggested that it could be worked up to . He acknowledged that looking at the sun could have ill effects , but characterized them as being " always temporary " and in fact the effects of strain in response to sunlight . He wrote that he had cured people who believed that the sun had caused them permanent eye damage . In his magazine , Bates later suggested exposing only the white part of the eyeball to direct sunlight , and only for seconds at a time , after allowing the sun to shine on closed eyelids for a longer period .

Posthumous publications of Bates ' book omitted mention of the supposed benefits from direct sunlight shining on open eyes .

= = Results and criticism = =

Bates ' techniques have never been scientifically established to improve eyesight . Several of Bates ' techniques , including " sunning " , " swinging " , and " palming " , were combined with healthy changes to diet and exercise in a 1983 randomized controlled trial of myopic children in India . After 6 months , the experimental groups " did not show any statistically significant difference in refractive status " , though the children in the treatment group " subjectively ? felt relieved of eye strain and other symptoms " .

In 1967 the British Medical Journal observed that " Bates [?] advocated prolonged sun @-@

gazing as the treatment of myopia , with disastrous results . "

The philosopher Frank J. Leavitt has argued that the method Bates described would be difficult to test scientifically due to his emphasis on relaxation and visualization . Leavitt asked " How can we tell whether someone has relaxed or imagined something , or just thinks that he or she has imagined it ? " In regards to the possibility of a placebo trial , Leavitt commented " I cannot conceive of how we could put someone in a situation where he thinks he has imagined something while we know that he has not . "

= = After Bates = =

After Bates died in 1931 , his methods of treatment were continued by his widow Emily and other associates , some of whom incorporated exercises and dietary recommendations . Most subsequent proponents did not stand by Bates ' explanation of how the eye focuses mechanically , but nonetheless maintained that relieving a habitual " strain " was the key to improving sight .

= = = Margaret Darst Corbett = = =

Margaret Darst Corbett first met Bates when she consulted him about her husband 's eyesight . She became his pupil , and eventually taught his method at her School of Eye Education in Los Angeles . She was of the stated belief that " the optic nerve is really part of the brain , and vision is nine @-@ tenths mental and one @-@ tenth only physical . "

In late 1940 , Corbett and her assistant were charged with violations of the Medical Practice Act of California for treating eyes without a licence . At the trial , many of her students testified on her behalf , describing in detail how she had enabled them to discard their glasses . One witness testified that he had been almost blind from cataracts , but that , after working with Corbett , his vision had improved to such an extent that for the first time he could read for eight hours at a stretch without glasses . Corbett explained in court that she was practicing neither optometry nor ophthalmology and represented herself not as a doctor but only as an " instructor of eye training " . Describing her method she said " We turn vision on by teaching the eyes to shift . We want the sense of motion to relieve staring , to end the fixed look . We use light to relax the eyes and to accustom them to the sun . "

The trial attracted widespread interest , as did the " not guilty " verdict . The case spurred a bill in the Californian State Legislature that would have then made such vision education illegal without an optometric or medical licence . After a lively campaign in the media , the bill was rejected .

= = = Aldous Huxley = = =

Perhaps the most famous proponent of the Bates method was the British writer Aldous Huxley . At the age of sixteen Huxley had an attack of keratitis , which , after an 18 @-@ month period of near @-@ blindness , left him with one eye just capable of light perception and the other with an unaided Snellen fraction of 10 / 200 . This was mainly due to opacities in both corneas , complicated by hyperopia and astigmatism . He was able to read only if he wore thick glasses and dilated his better pupil with atropine , to allow that eye to see around an opacity in the center of the cornea .

In 1939 , at the age of 45 and with eyesight that continued to deteriorate , he happened to hear of the Bates method and sought the help of Margaret Corbett , who gave him regular lessons . Three years later he wrote The Art of Seeing , in which he related : " Within a couple of months I was reading without spectacles and , what was better still , without strain and fatigue .... At the present time , my vision , though very far from normal , is about twice as good as it used to be when I wore spectacles . " Describing the process , Huxley wrote that " Vision is not won by making an effort to get it : it comes to those who have learned to put their minds and eyes into a state of alert passivity , of dynamic relaxation . " He expressed indifference regarding the veracity of Bates ' explanation of how the eye focuses , stating that " my concern is not with the anatomical mechanism of accommodation , but with the art of seeing . "

His case generated wide publicity as well as scrutiny . Ophthalmologist Walter B. Lancaster , for example , suggested in 1944 that Huxley had " learned how to use what he has to better advantage " by training the " cerebral part of seeing " , rather than actually improving the quality of the image on the retina .

In 1952 , ten years after writing The Art of Seeing , Huxley spoke at a Hollywood banquet , wearing no glasses and , according to Bennett Cerf , apparently reading his paper from the lectern without difficulty . In Cerf 's words :

Then suddenly he faltered ? and the disturbing truth became obvious . He wasn 't reading his address at all . He had learned it by heart . To refresh his memory he brought the paper closer and closer to his eyes . When it was only an inch or so away he still couldn 't read it , and had to fish for a magnifying glass in his pocket to make the typing visible to him . It was an agonizing moment .

In response to this , Huxley wrote " I often do use magnifying glasses where conditions of light are bad , and have never claimed to be able to read except under very good conditions . " This underscored that he had not regained anything close to normal vision , and in fact never claimed that he had .

= = = Modern variants = = =

" Natural vision correction " or " natural vision improvement " continues to be marketed by practitioners offering individual instruction , many of who have no medical or optometric credentials . Most base their approach in the Bates method , though some also integrate vision therapy techniques . There are also many self @-@ help books and programs , which have not been subjected to randomized controlled trials , aimed at improving eyesight naturally . Purveyors of such approaches argue that they lack the funds to formally test them .

The heavily advertised " See Clearly Method " (of which sales were halted by a court order in November 2006 , in response to what were found to be dishonest marketing practices) included " palming " and " light therapy " , both adapted from Bates . The creators of the program , however , emphasized that they did not endorse Bates ' approach overall .

In his 1992 book The Bates Method , A Complete Guide to Improving Eyesight ? Naturally , " Bates method teacher " Peter Mansfield was very critical of eye care professionals for prescribing corrective lenses , recommending most of Bates ' techniques to improve vision . The book included accounts of twelve " real cases " , but did not report any information about refractive error .

Czech native John Slavicek claims to have created an " eye cure " that improves eyesight in three days , borrowing from ancient yogic eye exercises , visualizations from the Seth Material , and the Bates method . Although he has testimonials from his neighbor and others , several of his students indicate that he has greatly exaggerated their cases . Slavicek 's self @-@ published manual , Yoga for the Eyes , was rejected by an ophthalmologist who evaluated it , and evinced no interest from the World Health Organization and St. Erik 's Eye Foundation in Sweden as he had not conducted double @-@ blind tests .

= = Anecdotal support = =

In support of the effectiveness of the Bates method , proponents point to the many accounts of people allegedly having improved their eyesight by applying it . While these anecdotes may be told and passed on in good faith , several potential explanations exist for the phenomena reported other than a genuine reversal of a refractive error due to the techniques practiced :

Some cases of nearsightedness are recognized as due to a transient spasm of the ciliary muscle , rather than a misshapen eyeball . These are classed as pseudomyopia , of which spontaneous reversal may account for some reports of improvement .

Research has confirmed that when nearsighted subjects remove their corrective lenses , over time there is a limited improvement (termed " blur adaptation ") in their unaided visual resolution , even though refraction indicates no corresponding change in refractive error . This is believed to occur due to adjustments made in the visual system . One who has been practicing Bates ' techniques and

notices such improvement may not realize that simply leaving the glasses off would have had the same effect , which may be especially pronounced if the prescription was too strong to begin with .

Visual acuity is affected by the size of the pupil . When it constricts (such as in response to an increase in light) , the quality of focus will improve significantly , at the cost of a reduced ability to see in dim light . This is known as the " pinhole effect " . This concept is also used in photography when changing the aperture size .

Some eye defects may naturally change for the better with age or in cycles (ophthalmologist Stewart Duke @-@ Elder suggested that this is what happened with Aldous Huxley) . A cataract when first setting in sometimes results in much improved eyesight for a short time . One who happens to have been practicing the Bates method will likely credit it for any improvement experienced regardless of the actual cause .

Some studies have suggested that a learned ability to interpret blurred images may account for perceived improvements in eyesight . Ophthalmologist Walter B. Lancaster had this to say : " Since seeing is only partly a matter of the image on the retina and the sensation it produces , but is in still larger part a matter of the cerebral processes of synthesis , in which memories play a principal role , it follows that by repetition , by practice , by exercises , one builds up a substratum of memories useful for the interpretation of sensations and facilitates the syntheses which are the major part of seeing . " Lancaster faulted ophthalmologists in general for neglecting the role of the brain in the process of seeing , " leaving to irregular , half @-@ trained workers the cultivation of that field " .

A 1952 study involving 100 subjects claiming to experience " flashes " of clear vision , in which eyesight momentarily becomes much sharper , found only one subject who " demonstrated unusually good transient acuity (a flash) but she was unable to maintain it or repeat it for measurement of refraction " and concluded that " ' flashers ' (those who can obtain remarkably large transient increases in visual acuity) are uncommon " . A 2004 study proposed that such flashes may be caused by " negative accommodation " (i.e. an active flattening of the lens by the ciliary muscles) .

A 1982 study of subjects who underwent computer @-@ based visual training concluded that any perceived resulting improvement in visual acuity is best explained as a contact lens @-@ like effect of moisture on the eye , based on increased tear action exhibited by 15 out of 17 subjects who experienced such improvement .

A 2003 study of claims that " positive suggestion (e.g. , using hypnosis) can significantly improve visual acuity " found that " neither suggestion nor hypnotic phenomena are likely to significantly improve myopic vision " .

= = General research = =

In 2004 the American Academy of Ophthalmology (AAO) published a review of various research regarding " visual training " , which consisted of " eye exercises , muscle relaxation techniques , biofeedback , eye patches , or eye massages " , " alone or in combinations " . No evidence was found that such techniques could objectively benefit eyesight , though some studies noted changes , both positive and negative , in the visual acuity of nearsighted subjects as measured by a Snellen chart . In some cases noted improvements were maintained at subsequent follow @-@ ups . However , these results were not seen as actual reversals of nearsightedness , and were attributed instead to factors such as " improvements in interpreting blurred images , changes in mood or motivation , creation of an artificial contact lens by tear film changes , or a pinhole effect from miosis of the pupil . "

In 2005 the Ophthalmology Department of New Zealand 's Christchurch Hospital published a review of forty @-@ three studies regarding the use of eye exercises . They found that " As yet there is no clear scientific evidence published in the mainstream literature supporting the use of eye exercises " to improve visual acuity , and concluded that " their use therefore remains controversial . "

= = General criticisms = =

= = = Dead @-@ end = = =

A frequent criticism of the Bates method is that it has remained relatively obscure , which is seen as proof that it is not truly effective . Writer Alan M. MacRobert concluded in a 1979 article that the " most telling argument against the Bates system " and other alternative therapies was that they " bore no fruit " . In regards to the Bates method , he reasoned that " If palming , shifting , and swinging could really cure poor eyesight , glasses would be as obsolete by now as horse @-@ drawn carriages . "

= = = Corrective lenses and safety = = =

Discarding one 's corrective lenses , as Bates recommended , or wearing lenses weaker than one 's prescribed correction , as some Bates method advocates suggest , poses a potential safety hazard in certain situations , especially when one is operating a motor vehicle . James Randi related that his father , shortly after discarding glasses on the advice of Bates ' book , wrecked his car . Bates method teachers often caution that when driving , one should wear the correction legally required .

= = = Avoidance of conventional treatment = = =

One of the greatest potential dangers of faith in the Bates method is that a believer may be disinclined to seek medical advice regarding what could be a sight @-@ threatening condition requiring prompt treatment , such as glaucoma . Also , children with vision problems may require early attention by a professional in order to successfully prevent lazy eye . Such treatment may include exercises , but which are different from those associated with the Bates method , and parents who subscribe to Bates ' ideas may delay seeking conventional care until it is too late . It may further be necessary for a child at risk of developing lazy eye to wear the proper correction .