EYEROBICS®

how to improve your eyesight

MARILYN ROY

Healthy Eyes and Better Vision... the Natural Way

EyeRobics

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Foreword

DR WILLIAM WEIS

I still remember sitting late at night in the old limestone library at Bowling Green, making sure that if I failed my freshman year in college it would not be for lack of effort. About the only time during my 18-hour days that my eyes weren't focusing on a book or writing tablet was in class, when I occasionally glanced up at my professors or at the overhead projection screen.

Halfway through my freshman year, my eyes started to protest. First, I had trouble focusing my two eyes together. This would happen every night about 9 p.m. – after 10 to 12 hours of close work. The words in my books just wouldn't hold still unless I closed one or the other of my eyes. Then I noticed the people and the furnishings in the old library were losing their definition – my distance world was getting blurry and my close-up world wouldn't hold still!

My family had always believed in pursuing the 'best' medical care available, so I made an appointment for an eye examination with a board-certified ophthalmologist (they were called oculists then). He examined my eyes and listened sympathetically to my sad story about losing my vision every night following a mere 10 to 12 hours of uninterrupted close-up focusing. He nodded with a calmness and understanding that gave me assurance that the deterioration of my vision was perfectly

normal and expected – after all, I was 18 years old. It was time to enter the adult world of corrective lenses. There was not the slightest suggestion that my loss of visual acuity was even partially under my control. It obviously had nothing to do with the fact that I started abusing my eyes every day at 7 a.m. and didn't stop until my focus was so impaired – by 9 or 10 p.m. – that there was nothing left for me to do but go to bed.

I noticed that many of my friends were experiencing a similar 'maturing' of their visual acuity – in fact, there was an epidemic of myopia sweeping through the university! We were all losing our ability to see in the distance and it was, from all we could detect from talking with our eye doctors, a purely uncontrollable phenomenon. It just happens at a certain age (for many, 18 seemed to be the magic year) and we were just lucky we hadn't been afflicted sooner.

That was 30 years ago. What followed for me was a lifetime of gradually worsening myopia (near-sightedness) as I continued to strain my eyes over long hours of close work and let progressively stronger lenses take care of my loss of distance vision. But at age 42, I made a fatal decision that would cause more deterioration in my vision over the next five years than had occurred over the previous 22 years since I first began wearing glasses.

My employer, Seattle University, added a 'vision care' benefit to my compensation package. I hadn't had my eyes examined for a number of years, so I immediately looked in the Yellow Pages for a board-certified ophthalmologist I could walk to from our campus. His office was on the second floor of a small two-storey building two blocks away. On the first floor was another business – an optical products dispensary.

I had my eyes examined and was pleased that I had no apparent eye diseases – pleased, but not surprised, since serious eye diseases are relatively uncommon at my age. However, in examining my vision, my doctor determined that my lens prescription should be strengthened. For convenience, I purchased my new glasses in the optical dispensary on the first floor. After all, my doctor's office was nice enough to offer me a '$20 off' coupon for glasses purchased downstairs.

I remember being impressed by two things from that visit. First, I was pleasantly surprised at how reasonable the fees were for my eye examination. I expected to pay at least twice the amount of the actual invoice. Second, I was unpleasantly surprised at how pricey glasses had become. It seemed like a lot of money for one pair of lenses and frames.

Now my story becomes unhappy. Within a matter of months, I began experiencing significant eyestrain and further loss of my distance vision. I was so alarmed by the rapid deterioration that I went back to my doctor, even though my insurance for another examination required at least a year between visits. He checked my eyes and confirmed what I already knew: I needed even stronger lenses due to a rapid change in my myopia. He assured me that this was nothing to be alarmed about, that these periods of deterioration 'often come in spurts at about your age'. I felt 18 all over again – losing my eyesight through no fault of my own. I just happened to hit the magic age of 42 and, hey presto, time for my DNA-programmed vision loss.

But it was just beginning. My eyestrain got worse. By evening, my eyes felt fatigued and overworked. And, often by noon, my eyes became so tired that I needed my strong distance

lenses to see clearly only a few feet away. Fortunately, it didn't cost me very much to go back repeatedly to my ophthalmologist to be reassured that this loss of distance vision was perfectly normal in a man of my age. Sometimes I could buy this reassurance for a mere $30 – a nice concession when my insurance wouldn't cover such frequent re-examinations.

As I saw it, there was only one 'winner' in this dismal scenario: the optical dispensary on the first floor. I sort of felt sorry for my doctor. Truth was that for every dollar I spent upstairs getting my eyes examined, I spent $8 down below! (I keep careful records.) All the money in this eye care business was going to the glasses and contact lens makers and sellers – very little went to the hard-working certified ophthalmologists!

As fate would have it, in the midst of this phase of rapid vision loss I talked with Marilyn Roy about her response to her own deteriorating vision. She had been wearing contact lenses for 20 years. When the last set she was using were causing her problems, she decided to restore her natural eyesight rather than stay on the squirrel wheel of continuing to buy corrective lenses.

Of course, I thought she was crazy. 'Don't you know', I argued, 'that your eyes just naturally get weaker with age? There's nothing you can do about it.' But she wasn't convinced. And after a year of practising with the techniques she presents in this book, she called me to report that she had just passed her driver's test and could drive an automobile without corrective lenses! She was 45 years old and had worn glasses and contact lenses for over 20 years!

I was astounded. In my 30 years of paying the extra bucks to consult with certified ophthalmologists, never had it been

suggested to me that I had some responsibility for my vision fitness. No one ever suggested that I could consciously slow the deterioration of my vision, let alone that I could actually restore lost visual acuity.

Why? Why didn't my doctor tell me that eyestrain – eye abuse in my case – contributed to my loss of acuity? Why hadn't anybody told me about people like Marilyn Roy, who take responsibility for their own visual fitness and do something about it?

I'm a business school professor, so often when I ask 'Why?' my mind goes to business explanations. And to business questions. For example:

1 *Where is the money in the 'vision care' industry?*

Answer: In optical products, where profit margins are astronomical. Where contact lenses that cost pennies to make are sold for hundreds of times their cost to produce. Also in surgery, where both the risks and the long-term benefits of treatment are problematical.

2 *Is there any money in natural vision improvement?*

Answer: No. None.

3 *Is there money in eye deterioration?*

Answer: Yes – in fact, that's where all the money is. During my own five years of rapid vision loss, I spent over $1,000 on

lenses, frames, and contact lenses – and only about $100 on eye examinations.

But there remained a lingering, troubling question. Why didn't my ophthalmologist tell me about vision therapy as a way of taking some responsibility for my own vision? I would gladly have paid him his modest fee either way. I would have gladly paid him more for such advice!

Then I started thinking bad thoughts – the kind we like to suppress. Not for one moment did I want to think that my gentlemanly licensed ophthalmologist might be taking referral kickbacks from downstairs! Professional medical ethics certainly wouldn't tolerate that. Right?

Well, I still don't know whether that's right or not. But as it turned out, my eye doctor was definitely *not* taking kickbacks from the optical dispensary downstairs. Of course, he didn't need to. He *owned* the optical dispensary!

My ophthalmologist is not unique in his dabbling at several levels in the 'eye care' industry. Ownership in optical supplies dispensaries among certified ophthalmologists and optometrists is widespread and endemic to the 'eye care' industry in America. Often the cost of eye examinations is simply a 'loss leader' to get customers in for the purchase of optical products and services: glasses, contact lenses, ever-changing frame styles, and corrective surgery. I wish I had known that five years ago. I now have a drawer full of prescription glasses that, thankfully, I have 'outgrown' as a result of applying a mere fraction of the suggestions presented in this book. I now am driving my car with glasses that have prescription lenses that are a mere third of the

strength before I started to take responsibility for my vision health. And I haven't even begun to do the exercises that Marilyn Roy recommends in this book – exercises that removed 'corrective lenses' from her driver's license in one year!

By working with approximately 5 per cent of the recommendations contained in this volume – those that take absolutely no time from my work day – I am now seeing better than I did 'four prescriptions' ago, and my eyes now never feel strained or fatigued. Just over a year ago my evening activities were a visual blur. I had to wear strong lenses to function effectively in virtually every activity of my day. Now I am again teaching without glasses – and seeing my graduate students clearly. I am playing goalie for two soccer teams under the lights – and I can see the ball at both ends of the field! Today it wouldn't even occur to me to wear glasses playing basketball – two years ago I had no choice.

It all reduces to one simple analogy. I have responsibility for all aspects of my physical well-being. Long ago I decided to take the time, regularly, to leave my office and my computer to go to our school gym for physical workouts. I could have chosen to stay in my office; the consequences would have been further muscle atrophy, higher body-fat density, higher blood pressure and resting heartbeat, and a dismal fitness profile.

Two years ago, I decided to try reversing my rapidly deteriorating vision, following the advice of this book's author. Without that decision, I would today have a drawerful of 'outgrown' glasses for the opposite reason – because my eyes would have continued to worsen.

Put simply, it makes little sense to exercise care for all parts of my body except for my eyes. Vision is a gift – a wonderful gift.

I know now that I have personal responsibility for and personal control over the care of that gift.

And so do you. This book will show you how to give yourself something very special – the gift of better vision. You can improve your vision. That is a fact. Unfortunately, you probably right now are doubting this assertion. And you doubt it because all the money in the eye care business is made by selling you 'corrective' lenses and 'corrective' surgery. So you have been told, indirectly or otherwise, that the only remedy for weak vision is to buy crutches – not to care for and exercise your eyes.

I suppose we can all be grateful that the money made each year from performing bone-setting surgery far exceeds the money made selling walking sticks and wheelchairs! Or else routine leg fractures would never be repaired and we would spend our remaining years using walking sticks and wheelchairs. Of course we would probably call them 'corrective' devices instead of what they really are: crutches.

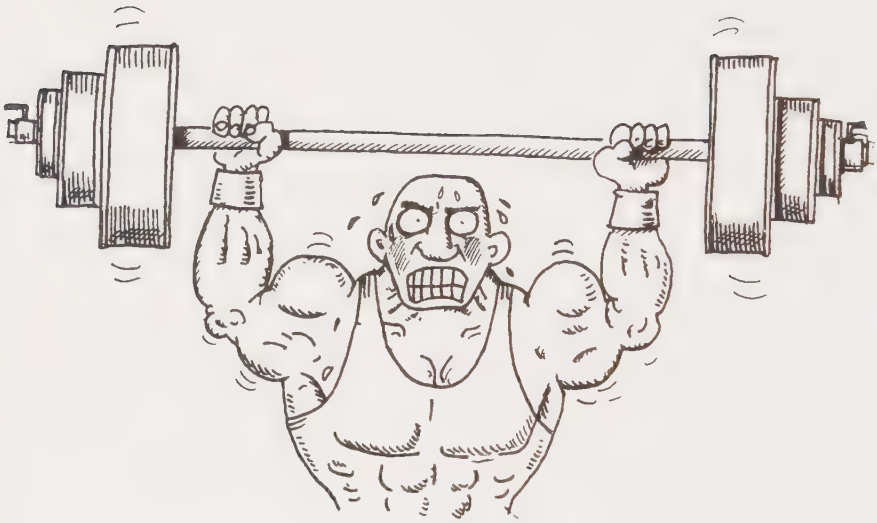
Yet that's what we are doing with our eyes. Abusing them until they become weak, and then accelerating the cycle of abuse and deterioration through ever-more-powerful 'corrective' lenses. Stop the cycle. Reclaim responsibility for your own vision fitness. Consult your ophthalmologist for detection and treatment of eye diseases – but stop short of turning over personal responsibility for your eyesight to anyone who may be profiting from its continuing deterioration.

DISCLAIMER

Note to the reader: the information in this book is presented as a general guide and is not intended as a substitute for regular diagnoses and treatment by a vision care professional. The author and publisher shall not have liability or responsibility with respect to loss or damage caused directly or indirectly by the information contained in this book.

1

Self-Assessment



"Your eyes need exercise too!"

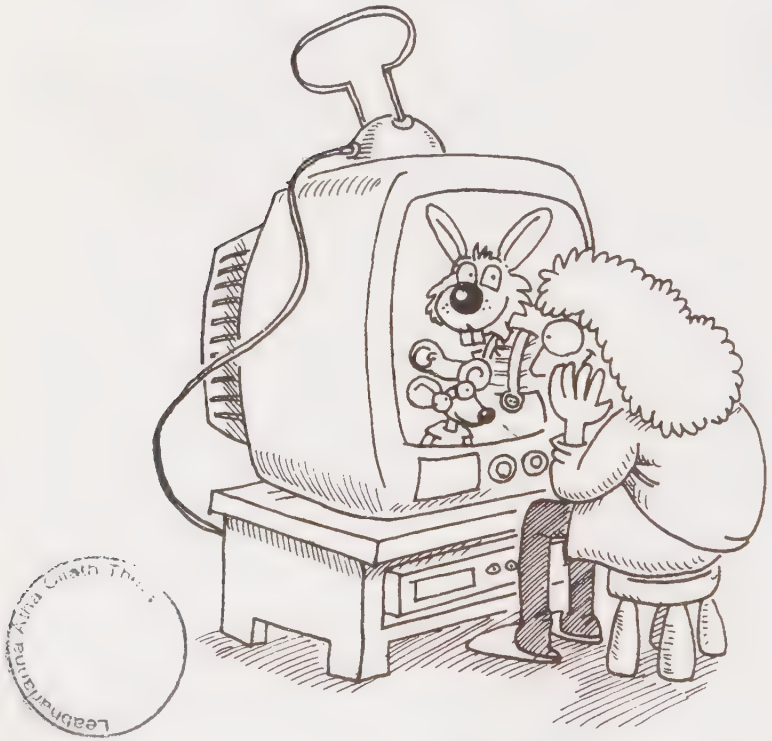
Introduction

Vision fitness is part of physical fitness, yet in our culture 60 per cent of the population rely on glasses to see clearly. It is estimated that 90 per cent of all individuals in the US will eventually use glasses at some point in their lifetime. In China the rising incidence of vision problems in children prompted educators to incorporate vision fitness programs in schools. Are there some techniques you can learn to maintain or regain vision fitness? Current research shows that there are techniques which can help you improve your sight.

Over the past 20 years we have witnessed a physical fitness revolution which has overtaken our country. We've been introduced to the benefits of aerobic exercises, stretching, weight training and yoga, along with a whole host of other recreational programs. Without exception we've found these activities beneficial to our health and well-being. Those individuals most caught up in this health craze stand in queues at health fairs to have their heart, lungs, fat and muscle measured and monitored. Doesn't it seem strange that after all this emphasis on fitness, we could so completely ignore the condition of our eyesight? Perhaps this is due to the outdated, but long-held belief, that poor eyesight was an irreversible condition. I have written this book to help you prove that for most people vision fitness is as attainable a goal as is general body fitness.

What's Your Story?

There was probably a time you can remember before you needed to wear glasses. Seeing clearly was automatic and something you didn't think about very often. When did this end for you, and what was happening in your life when you started wearing glasses?



'When did you first notice you had a problem with your eyesight?'

If you cannot remember exactly, get out an old family photo album and start paging through it. You will probably come across many pictures that will help you recall what your life was like about that time. You may be able to pinpoint the exact year by looking at old school photos, or you may recall events of the time from holiday snaps. Now you might find your reaction to your glasses quite different than your original reaction to wearing them when you were younger. Some people may notice that, in the early years, they did not consistently wear glasses in all the photos around that time period. Maybe the glasses were not a permanent feature until much later. It might also be interesting to notice whether other family members or friends were wearing glasses at this time.

I feel that each of us has a story and it is important to recall this information, because understanding the problem may help you in your quest to become less dependent on glasses. It might also give you some information about habits and beliefs that you once had or have developed concerning your vision. You may find you'll recall many more of the details if you actually write down your story in a journal. This way you can add details later that may not seem significant now. You can use this journal later to track your progress, note significant insights and record your beliefs and frustrations while you are working to improve your sight.

I'll recount my story for you, just to give you some idea of what I mean by recalling your history. I began wearing glasses in the fifth grade (age 11) to see the blackboard from the back of the room. My first pair of glasses had light blue, metal frames. I liked them and wore them for everything at first. My sister and

parents had been wearing glasses for some time before that. By the time I was in seventh and eighth grade, I see that I was not wearing glasses in school photos. By high school, I had stopped wearing glasses. I did not rely on them again until I was 23. This time I got glasses to take my driving test and I wore them infrequently outside of the car. In my early twenties I started working as an accountant during the day and I was also attending night school. Now that I think about it, being myopic is a pretty good definition for an accountant. At that time, however, I had not yet come to realize this obvious correlation. For the next 20 years, I wore glasses or contacts and occasionally visited my eye doctor for a stronger prescription. The deterioration in my sight had been as high as 20/100 in my late thirties. I also had an astigmatism correction.

At the age of 40, I changed my work schedule from full-time to part-time. I had started studying art and was spending 3–6 hours a week drawing or painting from models, which required constant refocusing from far to near. These changes in my daily routine meant that I was spending less time doing close work and more time looking into the distance. When I turned 42, my eye doctor noted that my distance vision had improved slightly, which was something I was glad to hear.

One day I just happened to come across a copy of *The Bates Method for Seeing Without Glasses*. I read parts of it and started experimenting with the ideas that very night. I had recently been having trouble with my contacts fogging up and I was looking for some alternative to wearing glasses for the rest of my life. Two weeks later I left for a hiking trip in England. I didn't leave my glasses at home, but I vowed that I would try to get

along without glasses during the trip as an experiment. I actually had no problems. Things were a little blurred but I didn't get lost.

When I first started working to restore my sight, I did not do many exercises other than not wearing my glasses, unless it was absolutely necessary, and checking my sight every day with an eye chart. Instead of exercises I tried to integrate seeing better into my daily life. If I was walking down the street, I tried to read all the signs or try to see people in the next street. If I was watching TV or a movie, I would focus on seeing peoples' eyes clearly or I would try reading the fine print on news graphics. Within months I started moving the TV further away.

Within four months of going without glasses I noticed that my eye muscles were letting me know when they were trying to see more. These strange little pulls or sensations around my eyes spurred me on, because I knew my eyes were starting to adjust to seeing more at a distance. I was seeing more clearly and I continued to make progress until I decided to work another tax season. During this time, I found it difficult to keep my gains with the intense full-time close work. After tax season, I reverted again to only doing close work part-time. It took me exactly 13 months in total until I was able to pass the driver's vision test without lenses. This test requires 20/40 vision. In the last six months before passing the test, I started using Brian Severson's *Vision Freedom* method in which you use 'plus glasses' to add resistance while reading. It helps train your eyes to become more flexible and stronger. This method gave me the additional power to be able to pass the driver's test. I'm still working with astigmatism in one eye, but I'm also still noticing a natural improvement over time.

When I think about the story of how I lost my perfect sight, I realize that my eyes were working well all the time. When I was a full-time accountant, I was requiring them to do intense close work for long periods of time and they accommodated very well by becoming myopic. Once I started wanting to see far again, they adjusted to become more flexible in a short time.

It's not easy to get used to not wearing glasses if you have been relying on them for years, and clear vision is not immediate, but the rewards of reclaiming your vision are well worth the time and effort.

Staying With It

The single most important element in any exercise program is maintaining motivation day after day for a long enough period so that the new behaviour becomes a habit. Eventually small repetitions can lead to major improvements in fitness when integrated into your daily life. These are some of the ways I stayed motivated.

I found that practising to see further into the distance kept me from being bored while waiting in queues or doing routine tasks. I got my family and friends involved, hoping their insights might help me improve my techniques. I continued to find that others were instinctively intrigued with the concepts and immediately wanted to tell me about how they'd lost their perfect sight. I frequently find visitors spontaneously checking their

own vision with the charts I have posted in the hall. Children never fail to turn this into a game.

It took me no time at all to convince my husband that he might also be able to become less dependent on glasses. He tried several of the things I suggested and has reverted to wearing an old, much weaker, prescription. He also finds that his eyes feel much less stressed by the end of the day.

In my quest to keep my motivation high, I decided to teach a class in these techniques in the local evening community education program. I've had a great response to my class. This is my fifth year of teaching and there continues to be a lot of interest in the course. I began developing this book as a learning tool for the class. Since I have now incorporated all the course material into this manual, it can be used as an independent self-help course at home.

Getting Started

The first step in designing a program that will benefit you is to determine your current ability to perform some simple vision tests. Don't become disillusioned if you cannot see the chart from the prescribed distance without your glasses. Just adjust your distance until you can read some of the letters and record the approximate distance you are from the chart. If you have mounted the chart on a wall, you might want to place a piece of tape on the floor marking this point. This will be your baseline measurement from which you will be able to measure your

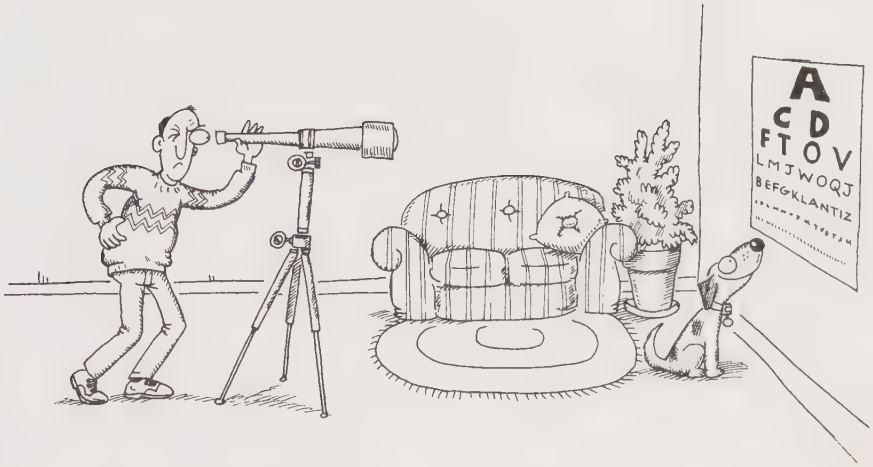
progress. Attempt to do each test and record your results. Be sure to keep and date this written record of your results for comparison later, because nothing will keep you motivated more than seeing measurable progress towards your goals.

The self-test begins on the next page. You can do the test both with your glasses on and off so that you can note the differences in the way you see with and without your glasses.

When I first tested myself, I was surprised to see that I had trouble seeing the 20/20 line even with my glasses on. As I progressed, I found it interesting to notice the greater clarity that I had achieved both with and without my glasses. Soon I was able to see the 20/15 line clearly with my glasses on.

Measuring distance vision or acuity is usually the first test most people think of when they have their eyesight checked, but this is only one measurement which is important in seeing clearly. In the test, I have also included questions on clarity, reading acuity, eye dominance and the ability to process images with both eyes.

Please turn to the next page and complete the self-test before reading further. It is important to determine specifically what your needs are before proceeding so that you will be able to decide what information and exercises are relevant to you. For example, problems relating to astigmatism probably will have little relevance to those who are farsighted, since astigmatisms that need corrective lenses are almost always in short-sighted individuals.


A
C D
F T O V
L M J W O Q J
B E F G K L A N T I Z

Vision Self-Test

Baseline Chart

Use this chart to record answers to the test questions that begin on the following page.

		Without Glasses			With Glasses	
	Date	Both eyes	Right eye	Left eye	Right eye	Left eye
1. DISTANCE ACUITY						
2. CLARITY: a. Shadows or Double Vision? b. Blurred – no sharp edges? c. Sensitivity to bright light?						
3. READING ACUITY						
4. ASTIGMATISM TEST a. Horizontal Lines Clearer? b. Vertical Lines Clearer?						
5. PROCESSING IMAGES						
6. EYE DOMINANCE						

Record your answers on the Baseline Chart located on the previous page.

1 Distance Acuity

Use the Eye Chart on page 15 to determine the smallest line of print that you can see standing twelve feet from the chart.

2 Clarity

A Do you see any double images or shadows of other letters in the white spaces?

B Do the edges of the letters appear to be crisp and clear or are the edges grey and blurred?

C Are you sensitive to bright lights? Do you need to wear sunglasses often?

3 Reading Acuity

Find the reading chart that is located on page 17. Hold the reading chart approximately 14 inches (35 cm) from your eyes and determine the smallest row of characters that you can read. You should be able to read the smallest line if you have perfect reading vision.

4 Astigmatism Test: Distance Distortion of Horizontal, Vertical, or Diagonal Lines

Use the geometric designs on the bottom part of the reading chart to see the effects of astigmatism. Hold the designs at reading distance or move them further away. If you have astigmatism you will notice shadows, blurs or distortions through parts of the design while other parts will appear clearer. (You may need to place the designs on the floor and view them from a standing position to see the distance effect.)

5 Processing Images with Both Eyes

Look at an object such as a chair or lamp 10 to 20 feet (3–6 m) from you. Now bring your finger up in front of your face while you are still focusing on the object. Notice in the foreground you see two fingers. Now focus on your finger and notice in the background there are now two chairs (this is what you are doing when you cross your eyes.) If you do not see the two chairs or two fingers when you do this exercise, your brain may not be processing the messages from both of your eyes.

6 Eye Dominance

Use a pencil to punch a hole in a piece of paper. Now look at an object across the room. Bring the paper with the punched hole up in front of your eyes so that you can see the object through the hole. Close one eye. If you can still see the object, the open eye is your dominant eye. If you cannot see the object, your other eye is your dominant eye.

Mount this chart on a wall where there is an artificle light source and the lighting is consistent day and night. Stand 12 feet from the chart to test vision.


C E
20/100
F B T
20/70
E D K A
20/50
R O P N S X
20/40
T U Y G Z D R
20/30
F L S E Q A C P
20/25
B O T N G Z H F
20/20
S N R G V O P F L
20/15
20/10

This page was intentionally left blank so that you can remove the eye chart and mount it on the wall.

HVBE 9482

BKGX 85321

CFPY 95473

TEYPQ 68421

HLKW 67392

TBJS 648310

NGAT85321

FYOEC 79354

PDKX 54658

GEOMETRIC DESIGNS

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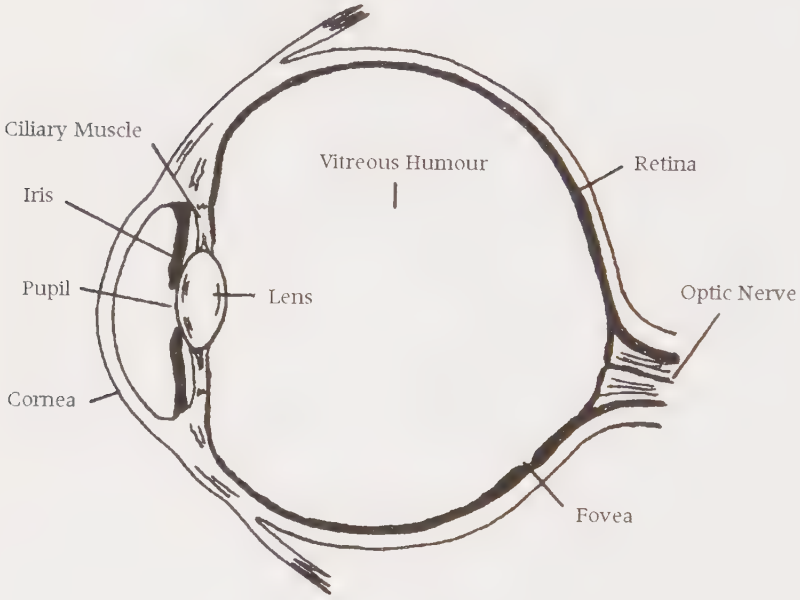
2

Mechanics and Theory

Basic Structure of the Eye



How Eyes Work

Refer to the diagram of the eye on page 20 as you read through this description of the basic structure of the eye.

The **cornea** is the clear covering on the outside of the eye. It serves as a protective shield, but it has another important function. Because it is round in shape, it also serves as a lens, which does most of the focusing of the light rays as they enter the eye.

The **iris**, which is the coloured part of the eye, is a muscle that regulates the amount of light entering the eye. The iris expands and contracts the size of the pupil, allowing more light to enter the pupil in dim conditions, but reducing the size of the pupil to allow less light into the eye in bright conditions.

The black **pupil** is an aperture or opening in the eye through which light enters.

Behind the pupil, the light passes through a **lens** that changes shape to focus the image on the retina.

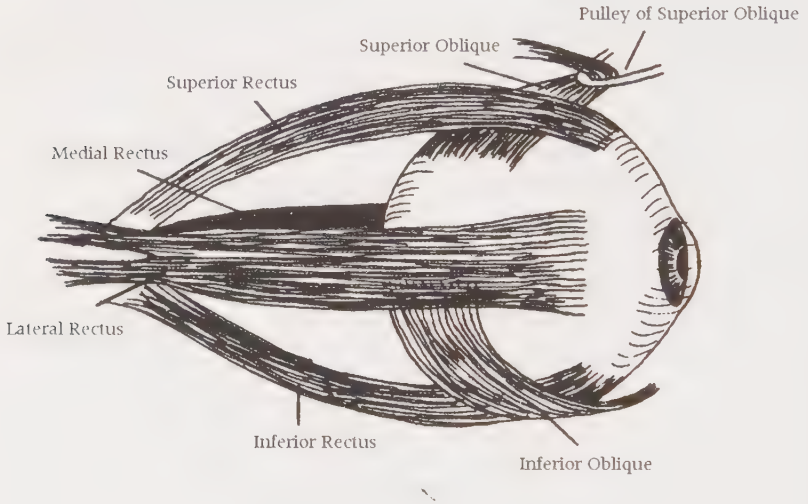
The **ciliary muscle**, which is an involuntary muscle, forms a circular band around the eye. It contracts to pull the lens into a convex shape while reading or looking at something close-up, and relaxes to allow the lens to take on a flatter or even concave shape to focus in the distance.

Before the light rays hit the retina, they pass through the **vitreous humour**, which is a clear gelatinous material filling the interior of the eyeball.

Finally, light reaches the **retina**, which is a multi-layered light-sensitive membrane lining the inner eyeball. The retina transmits the information through the **optic nerve** to the brain, where the image is translated so that we recognize what we are

seeing. When the image is focused on the **fovea**, a particularly sensitive area of the retina, a very distinct image will be seen.

Diagram of the Exterior Muscles of the Eye



Exterior Muscles of the Eye

There are six large voluntary muscles on the outside of the eyeball. The four recti muscles attach to the outer layer of the eyeball. They are approximately evenly spaced around the eye and pull directly over the top, bottom and sides of the eyeball. The two oblique muscles form an almost complete band around the middle of the eyeball. In relation to the size of other muscles in the body, these six muscles have been described as being 100 times as powerful as necessary to do the tasks that they are expected to perform.

These muscles are responsible for changing the shape of the eye, which is necessary to change the focus from near to far. They also allow us to change the direction of our gaze.

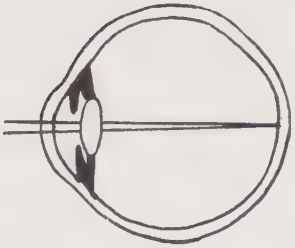
As seen in the muscles in the rest of our body, the recti and oblique muscles work as opposing forces. The oblique muscles wrap around the eyeball and when contracted they elongate the eye to see close. The recti muscles pull back on the cornea when contracted to flatten or shorten the eye to see far. The eye shortens to see far and elongates to see close, just like one adjusts a pair of binoculars.

The oblique muscles are involved in producing short-sightedness. The recti are involved in producing astigmatism and far-sightedness.

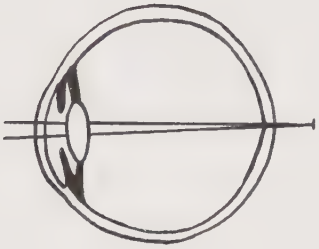
Common Refractive Errors

Refractive errors occur when something causes the light rays to focus at a point other than on the retina. When this happens the person sees a blurred or distorted image rather than seeing a clear and focused image. Refractive errors are usually caused by tense muscles that keep the eye from relaxing enough to automatically refocus from near to far or vice versa. Over time these tensed muscles can actually reshape the cornea and eyeball so that they no longer return to a perfectly round shape, while the opposing muscles lose coordination or became weak so that they no longer correct the problem. A person with refractive errors has really only lost muscle coordination and flexibility. Even if the shape of the eye has changed, the condition is reversible. There follows a description of the most common refractive errors.

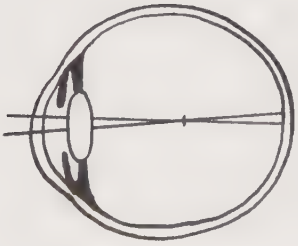
a. Normal Sight. Focus point is on the retina.



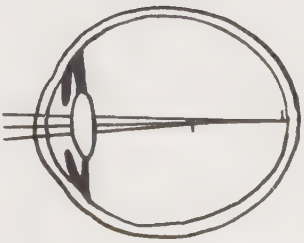
b. Far-sighted (Hyperopia). Focus point is beyond the retina. The eyeball is slightly short.



Short- or near-sighted (Myopia). Focus point is short of the retina. The eyeball is elongated.



d. Astigmatism. There are multiple focal planes due to an irregularly shaped cornea. If a correction is needed for astigmatism, the person is usually short-sighted.



Short- or near-sightedness (Myopia)

A short-sighted person can see to read and do close work, but has trouble seeing the eye chart 20 feet (6 m) away. When a short-sighted person focuses to read he has no problem, his eye elongates so that the image falls directly on the retina. When he tries to see far, his eye remains too elongated, causing the light rays to come into focus at a point in front of the retina. The image is blurred because the light rays begin again to diverge behind the focus point.

The physical cause of the blur may be due to several things. The oblique muscle, if not relaxed, could hold the eyeball in an elongated position. Pressure in the eye, from not relaxing, may have caused the cornea to become too steeply curved, or the ciliary muscle may not be able to relax enough to allow the lens to flatten.

Many studies have been done which have shown a high correlation between myopia and doing a lot of reading or other close work. If the eye muscles do not relax completely for far-focus, the eye is held in this contracted state, and the person is over-focusing for distance. Dr Trachtman, inventor of a device to cure myopia, has shown that merely being able to relax the ciliary muscle can improve short-sightedness significantly. Eighty per cent of people wearing glasses are short-sighted and most develop this condition by their early twenties.

Far-sightedness (Hyperopia)

This person can see far but has trouble focusing to read. In far-sightedness, the person has no problem seeing the eye chart

because the eye shortens enough to see into the distance, but when he tries to read the eye does not lengthen enough, causing the light rays to come into focus at a point behind the retina so the image appears blurred. The physical cause of the blur may be due to the recti muscles not being able to relax enough, which causes the eyeball to be too short or the cornea to be too flat. Another problem may be that the ciliary muscle may not be able to contract enough to bend the lens in order to focus clearly. The short-sighted eyeball is definitely elongated, but the far-sighted eyeball is only slightly shorter than normal. In far-sightedness the person is under-focusing for close work.

Near–Far Vision

Some people have one eye which is able to see far, and one eye which has adapted to seeing close. This is called near–far vision.

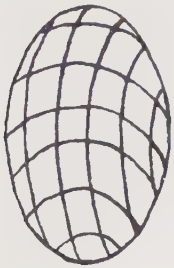
Presbyopia (literally 'Old Person's Sight')

This condition is the gradual loss of accommodative power for close work. Somewhere between the ages of 40 and 50, it is common to experience trouble focusing to read. Most authorities attribute this to the lens becoming less flexible as we age. Consequently the ciliary muscle begins to have difficulty bending the lens to focus close. Even those who are short-sighted are affected by presbyopia.

Astigmatism

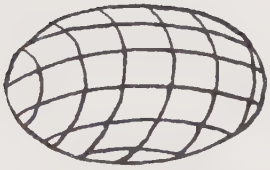
If you think you have an especially peculiar case because you have an astigmatism correction, don't let this disturb you any longer. Actually astigmatism is the most common refractive error and it occurs in 90 per cent of all eyes. Astigmatisms that need correction, however, are typically associated with myopia. No eye is perfectly round, but an eye that has perfect vision has a smooth round cornea that focuses the light rays together, just as a magnifying glass focuses a beam of sunlight. Astigmatism is created because the recti muscles are pulling unevenly, causing the cornea to become more elliptically shaped. Usually the cornea has taken on a steeper curve or arch across the diameter, either along the horizontal or vertical axis. This irregular curvature causes some light rays to focus in front of the retina while others may focus further back. The image appears distorted due to the multiple focal planes. The blur zones caused by astigmatism can be seen when one views a geometric design. You may see the parallel curving lines clearly on some parts of the design, but blur zones may distort other parts of the image. If the cornea is round, all the lines will appear equally clear. If the cornea is unevenly curved, horizontal lines may fade out, vertical lines may fade out, or diagonal lines may fade out. Relaxing the eye can diminish astigmatism.

Distortions due to Astigmatism.



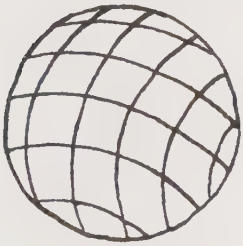
a. More steeply curved left to right

At a distance vertical lines blur.



b. More steeply curved top to bottom

At a distance horizontal lines blur.



c. Evenly rounded

At a distance all lines equally clear.

How to Read Prescriptions

Lens powers are measured in *diopters*. The higher the number, the stronger the lens. Plus signs (+) are used to indicate reading glasses or magnifying lenses. Minus signs (−) are used for indicating distance or reducing lenses. Magnifying lenses are convex in shape. They bow out and are thicker in the middle than at the edges. Minus lenses are concave and bow in so they are narrower in the centre than at the edges. For astigmatism the lens will have an additional cylinder ground into it which is aligned to compensate for the opposite cylindrical formation of the eye.

A prescription might be written like this:

OD (right eye) −2.25 −.50 × 175 degrees
OS (left eye) −2.00 −.25 × 175 degrees
add OU (each eye) +1.50

This prescription is for bifocals. The right eye needs a short-sighted correction of −2.25, and an astigmatism correction of −.50 at 175 degrees. The left lens is slightly weaker, only needing a −2.00 short-sighted correction and a −.25 astigmatism correction. In addition a magnification correction of +1.50 is made on each lens for reading.

Roughly speaking, 20/100 vision needs −1.00 correction, 20/200 a −2.00 correction; however, prescriptions may be stronger to ensure that the patient has perfect vision in the worst possible lighting conditions.

Eyeglasses do not actually correct the images that your eyes see, they create distortions in proportion. Concave lenses reduce

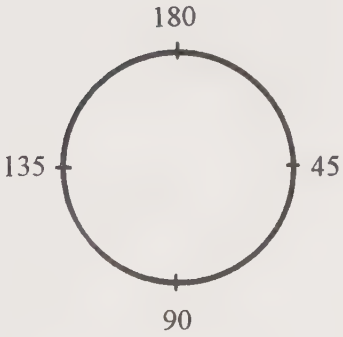
the size of the images you see, and convex lenses magnify the images. Cylinders produce some distortion even though they are aligned to compensate for the irregular shape of the eye.

Corrective Lenses

a. short-sighted correction: concave lens.

b. far-sighted correction: convex lens.

c. astigmatism correction: cylindrical lens.



d. angle of astigmatism is measured on a 180-degree circle.

The Eye Chart

Herman Snellen, a Dutch ophthalmologist, designed the first eye chart in the 1860s. The only objective of the chart is to determine how much distance acuity we have. Although our eyes were designed for distance vision, we now rarely use our eyes to see in detail at a distance of 20 feet (6 m). The 20/20 line was established to demonstrate the size of print a person, with good eyesight, could read standing 20 feet away. Twenty feet was used because light rays entering the eye at that distance are parallel, and our eyes are not required to bend the rays to focus them on the retina. The eye would function in the same way for light rays past 20 feet, so it is not necessary to test our sight at a further distance. If someone has 20/100 sight, this means that the smallest line he can read at 20 feet someone else (i.e. someone with 20/20 vision) could read from 100 feet away. Likewise, if someone has 20/15 vision, he can read at 20 feet the letters that can only be seen at 15 feet by someone who meets the standard measure of good eyesight. If someone's eyesight can only be corrected to 20/200, they are considered legally blind.

How Pinhole Glasses Work

If you have trouble seeing without your glasses, you may find it amazing that you can see much better if you simply look through a pinhole punched in a piece of paper. The pinhole actually is focusing the light rays so they enter your eye as parallel lines, and your eye is not required to do as much focusing to see more clearly. This is the same concept that is used in pinhole

glasses. Although they don't correct your vision, they will give you the experience of being able to see better without actually relying on corrective lenses. I have heard personal testimonials that these glasses are a helpful exercise tool for people who are far-sighted or have presbyopia.

Eye-Hand Dominance

Use the Vision Self-Test (page 15) to determine which is your dominant eye. The dominant eye has been shown to process information slightly faster than the non-dominant eye. Usually if you are right-eyed, you are also right-handed and vice versa, but some people have crossed dominance.

You may find it interesting to concentrate on improving your eyesight as an extension of practising your favourite sport. Probably the number one rule in sport is to keep your eye on the ball all the way through play. You will find that different vision skills are used for different sports. For example, reaction time is important in baseball, but not golf; peripheral vision is not important in archery.

Historical Perspective

Myopia has been the primary vision problem afflicting young people since the early 1800s, and continues to be the most common reason that people need glasses. According to Drs Seiderman and Marcus, in their book *20/20 Is Not Enough*, an ophthalmologist named James Ware had noted a high correlation between doing close work, such as reading, and short-sightedness as early as 1813. He was observing applicants for military service and found that 25 per cent of Oxford students were short-sighted. (Nowadays, 80 per cent of graduate students are short-sighted.)[1] The incidence of short-sightedness was far less frequent among the rest of the population, which included many farmers and fishermen.

Since then many other researchers have reported similar results from studies done on various cultures around the world. One of these studies, published in the September 1969 issue of the *American Journal of Optometry*, involved 1,200 Eskimos in Barrow, Alaska. The study indicated that the incidence of myopia escalated dramatically within one generation, such that 65 per cent of children were affected, while myopia was found to be nonexistent among their grandparents and affected only 5 per cent of their parents. The children affected were the first generation that had attended school, learned to read and, as a result, spent more time indoors. Lack of good indoor lighting in Eskimo homes at the time may have contributed to the problem. The statistics bear out the fact, in the many studies which have been done in diverse cultures, that although genetics may play a role myopia is highly

correlated with educational level, which requires intense close work.

Around the turn of the century a prominent American ophthalmologist, Dr William Bates, developed a revolutionary model for explaining and treating vision problems. He proposed that vision problems were not caused by the mechanical factors within the eye but instead by a combination of physical, emotional and mental responses to our environment – basically the stress of modern civilization. He also noted the increase in vision problems as children went through the educational process. After studying thousands of patients with vision problems, Bates realized that prescribing glasses was not a satisfactory solution to poor vision. Bates thought that when glasses were prescribed, the patient could immediately see better, but usually returned within a couple years only to require a higher prescription, while the real problem of poor vision went unaddressed. Quoting from Bates, as written in Dr Marilyn B Rosanes-Berrett's book *Do You Really Need Glasses?*,

> Myopia and hyperopia are not permanent, irremediable disabilities determined by the fixed shape of the eyeballs. Their shape is not fixed – it can change constantly in response to many factors, among them tense muscles. If an eyeball does not change its shape, it is because those muscles are tense from strain, and hold it rigid, or are flaccid from disuse or misuse, and exert no effect.

In order to cure vision problems, Bates prescribed relaxation techniques, use of eye charts, and mimicking the normal constant movement of healthy eyes, which includes blinking often.

Unfortunately the Bates method was not accepted by the medical community in the early 1900s. Despite this setback, Bates' technique continued to be practised and his book, *The Bates Method for Better Eyesight Without Glasses*, is still available in bookshops today.

Aldous Huxley, author of *Brave New World*, wrote *The Art of Seeing* after successfully using the Bates method to overcome a near-blind condition. The techniques described in both books seem in line with the recently popular holistic approach to healing. Since the 1940s, others have built on this research and methodology. Current books include many written by optometrists, educators and laypeople who have successfully cured themselves using similar techniques. These methods are being used throughout the world. The Bates Method is being taught primarily in England and India. However, other natural vision improvement practitioners can be found in Canada, Australia, Germany, Belgium, Switzerland, the Netherlands and Italy.

Dr Liberman notes in his book *Take Off Your Glasses and See*, that in 1949 the Chinese government decided to do something to offset the rising incidence of myopia and initiated a program in schools and factories which devotes 20 minutes a day to eye exercises. The Chinese claim that this has reversed the increase in myopia in China. For further study, see the Bibliography (page 103) for a list of other books available on this subject.


£600

Consumer Beware

Before the craze of aerobics and 10-minute abdominal videos, women relied on the fashion industry's solution for abdominal bulges. Remember the old advertisements for girdles in the 1950s, which convinced women that the solution to a bulging stomach could be purchased in the lingerie section of any department store? Thanks to Jane Fonda and a number of other fitness instructors, women of the 1990s are no longer as gullible as they once were and realize that the only true solution for lack of body fitness is an optimal exercise routine and lifestyle changes that support health and fitness. Besides the obvious improvements exercise makes to our appearance, aficionados become addicted to the other rewards which come with it, including: better health, increased strength, more energy and an overall feeling of well-being. In the longest-running study of exercise and ageing, Dr Fred Kasch at San Diego State College has documented the fitness level of 30 men over 23 years, comparing those who've continued to exercise to those who stopped exercising. 'Over twenty-three years, the regular exercisers lost fitness at one-third the annual rate of those who did not exercise,' according to M Elaine Cress, Ph.D. and research assistant professor at the University of Washington's Department of Medicine/Geriatrics. This was published in an article printed in the July 1996 edition of *Northwest Prime Time Journal*.

Unfortunately, the eye products industry is no more ethical than any other big business in our free enterprise system. Selling more merchandise has become the goal in our consumer society. According to Richard Leviton in his book *Seven Steps*

to Better Vision, 'In 1990 Americans spent over $15 billion on eye care and prescription lenses.' Eye care products have also fallen into the fashion marketing schemes. Often the eye exam is the least expensive part of a trip to the eye doctor. Prescriptions remain obscure, and prevention and non-surgical correction of common refractive problems is never mentioned. (Until legislation in 1996, eye care specialists in Washington state in the US were not required to give patients a written copy of their prescriptions, making it nearly impossible for price-comparison shopping.)

Now the optimum solution is the purchase of various optical devices or expensive surgery which offers an instant and effortless fix for the patient and a high monetary reward for the eye industry. But, like the girdle, these solutions do nothing to address the prevention or reversal of poor sight. For many individuals, lack of any preventative action has actually resulted in a serious dependency on using glasses.

Ethical questions arise as to whether responsibility lies with eye care specialists (to advise us on better eye fitness) or with the individual (to demand solutions that address the underlying problems). Unfortunately, when there is a conflict of interest in the industry, as there is with some eye care specialists who run their own optical dispensaries, the incentive is to sell the product rather than offer advice on prevention or improvement.

Can Progressive Myopia Be Avoided?

After I became interested in correcting my vision, I began talking to others more and more about eyesight. This naturally led

people, some new acquaintances and some old friends, to describe their optical histories to me in detail. I began to notice that most people's experiences fit into one of two general scenarios.

The following is a summary of the most common story for those who are short-sighted. They begin by telling me when they started needing glasses. This was usually while they were in school, often primary school. They were given a prescription for 'negative lenses' and they have diligently worn their glasses ever since. Now they are in their twenties, thirties and forties or older, and they proceed to describe how much their sight has deteriorated over the years. As their field of clear vision has narrowed, their prescription has continued to increase, sometimes to an alarmingly high number.

Now I'll tell you about the other group of people who started having difficulty with short-sightedness, but received different advice. Some of these people were given a prescription for bifocals which had a negative prescription above for distance, but a weaker lower lens for reading. These people report that they have mild myopia now, and some report that their distance sight improved after they started using bifocals. Surprisingly, others were given reading glasses (plus lenses) to use while reading and report that they did not progress further into myopia. A third group reports that they started using eye exercises at some point and some of them were able to stop using glasses totally or reduce their prescriptions.

It's interesting to see that the stories my friends described seemed to fit with my experience. My sight continued to worsen and did not improve until I began to apply the techniques included in this book.

I doubt that there is a single solution for everyone since eyesight is complex, but I believe that people have a right to be involved in making an informed choice about their treatment. It's clear from the above stories that alternative approaches are being successfully implemented. In fact, 25 per cent of eye care professionals in the United States now recommend preventative methods. If your eye doctor is not able to provide alternatives for helping you, look around until you find one who will address your concerns and assist you in improving your sight. You might find a listing in your phone book for a professional who offers vision therapy. Your local library or health centre might be another good source of information.

What About Children?

New research suggests that we should carefully consider how we treat early myopia in children. We are now realizing that nature has already equipped young animals with a built-in biofeedback mechanism that amazingly causes eyes to stay in focus as they develop and change shape. Interfering with this natural process might actually cause more harm than good.

A report published in the August 1995 edition of *Nature Magazine* showed that the eyes of young Rhesus monkeys react to blurred images by changing shape while growing, so that their eyesight naturally attempts to correct back to clear vision. In the experiment, glasses containing two different lenses were permanently placed on young Rhesus monkeys. One eye was fitted with a plain lens that did not affect the clarity of the image. The other eye was fitted with a lens that created a

blurred image by focusing the image either in front of the retina or behind the retina. After three months, one eye had grown more than the other had, compensating for the difference in the lenses. When the glasses were removed, the eyes continued to grow at different rates until they eventually returned to similar lengths and vision returned to normal. These results are supported by past animal research which has found that other species of animals also react to unfocused images by altering their eye growth to correct the blur.

It is highly likely that young children have this natural correction mechanism, too, since their eyes generally maintain clearly focused images throughout childhood even though their eyes dramatically change size during this time. This research brings into question the most common use of glasses for refractive errors over the last 40 years – a pair of single-vision lenses for full-time use. When used for myopia, the negative lens eliminates the blurred image at a distance, but still causes the focal point to fall behind the retina if the glasses are worn for close work. Some rather compelling research suggests that using bifocals on children mitigates this problem. In 1973, Young and Oakley presented a paper entitled 'Bifocal Control of Myopia' at the annual meeting of the American Academy of Optometry. The study compared 226 myopic children who were fitted with bifocals (eyestrain-reducing glasses) against a control group of 192 subjects who were matched for age, sex, initial refractive error and duration of wear. The results were significant and showed that bifocals reduced the rate of progressive myopia even in children who had as much as 4–5 diopters of myopia prior to being fitted with bifocals. The control group showed

a progression of myopia that was 20 times faster than the bifocal group.

Since 1950 the incidence of short-sightedness has risen from 15 per cent to over 40 per cent of the general population, and is as high as 80 per cent among university graduates. Perhaps those old admonitions of our grandparents' generation warning us about short-sightedness shouldn't have been taken so lightly. How appropriate were these warnings after all?:

Sit across the room from the television set.

Since I began working at improving my short-sightedness, I've used television effectively for distance viewing as a break from close work. By gradually increasing the distance I sit away, I've used the TV as practice in seeing distant objects more clearly, with positive results. I now enjoy being able to sit over 15 feet (5 m) away.

Don't hold that book so close to your nose.

When I wanted to correct my short-sightedness, I started by getting used to not wearing my distance glasses or contacts while reading and working on the computer. Then I started emulating a far-sighted individual and I pushed the material even further away. For normal vision, a book should be held 12 to 16 inches (30 to 45 cm) away.

Don't read in bad light.

Less light makes it harder to distinguish the letters because the contrast between the print and letters is diminished. The image needs to be more sharply focused in dimmer light or it will not be as readable.

> Sport and play will give you the chance to enjoy a variety of activities (including long-distance focusing) needed to maintain a healthy, strong body.

Our body is very efficient and maintains only as much strength as it needs to accomplish its daily routine. This is why we need a varied routine of daily exercise to keep it strong, healthy and functioning at optimal levels.

Are We Over-using Tinted Lenses?

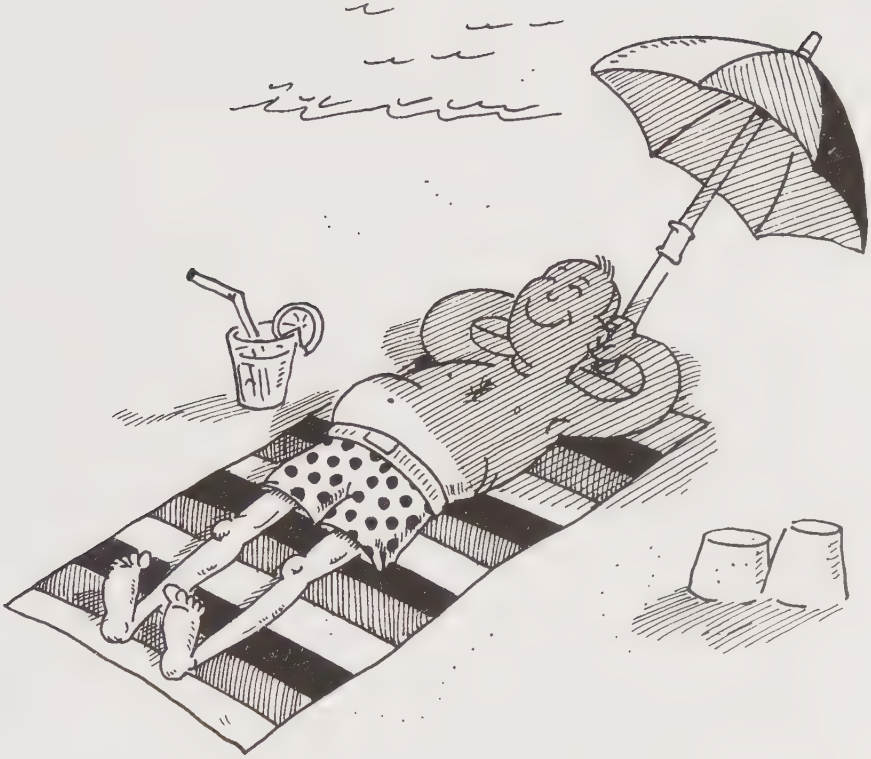
It's wise to wear a quality pair of tinted glasses (sunglasses) that block ultraviolet light on bright days when we are spending time outside in the sun. It's important to make sure that the tag on any pair of sunglasses you buy specifically states that they *do* block ultraviolet light, because dark lenses cause the pupil to dilate which could potentially let in *more* UV light than normal. Exposure to glare, even off water or snow, can cause serious burns to the cornea and retina.

But the question arises, how much should we be using tinted lenses? The research can be confusing. There have been a lot of warnings recently in the media on the growing dangers of ultraviolet light, and UV light has actually been shown to be a risk factor for cataracts along with poor diet, diabetes, use of

steroids, and smoking. Studies show that blue-eyed people who do not wear sunglasses in tropical climates have a higher incidence of cataracts than brown-eyed people who wear sunglasses. Still, some authorities maintain that it isn't clear from the research that protecting one's eyes from sunlight will actually reduce the risk of developing cataracts. Clearly we need to continue to study these factors, but we also need to be aware that research shows that some exposure to full-spectrum natural light, which includes ultraviolet light, is necessary for good general health and also for healthy eyes.

Advertisers and marketers have made tinted contacts and tinted glasses (sunglasses) popular fashion items. I see people using coloured lenses for standard-prescription use indoors and out, day and night. Perhaps the product appeals to our desire to spend leisure time in the sun while we actually find ourselves working more at occupations that require us to put in long days indoors. The reality is that many people wear tinted lenses more while reading the newspapers and magazines, and shopping in the malls where tinted lenses (sunglasses) are marketed, than they actually wear them at the beach.

At one time I wore sunglasses a lot, even though I lived in Seattle where people are always complaining about the grey, rainy days. I feel that the combination of wearing contacts, working constantly indoors under fluorescent lights, and wearing sunglasses often, even on cloudy days, had made me very sensitive to bright light. Moderately bright days and even the lights at live theatre performances would cause me to squint and make my eyes water so that I had a hard time keeping my eyes open. When I began to correct my vision, I realized that



people with good eyesight were able to adjust to normal sunlight without squinting. The iris is designed to contract to block out bright light, and the brow ridge is designed as a natural shade for our eyes. I found that weaning myself away from the over-use of sunglasses not only solved the problem of light sensitivity, but also improved my distance sight. This was probably because a smaller pupil size focuses light at a finer point, making the image clearer.

My home has two rooms which receive a lot of natural light during the day, and two rooms which receive little natural light. My eye chart is in a low-lit hallway. After I have been reading or working on the computer, I sometimes find that the letters on the chart are blurry. I've noticed that going over to the window and looking out for a few seconds relaxes my eyes so that even after I return to the darker hallway I can see the chart more clearly. Now I try to do as much work in the naturally lit rooms as I can. When I do find myself reading in a dimly lit room, I feel my eye muscles working harder to adjust.

Sometimes fluorescent lights also bother my eyes now that I have improved my short-sightedness. Even though I can still see the smallest line on the reading chart easily, I recognize that using good light while reading helps my eyes relax. I have purchased full-spectrum lamps for the rooms I spend a lot of time in because they give brighter, better colour-balanced light. My plants also seem to like them better!

Since our eyes evolved in an atmosphere of full-spectrum light, we have adapted to it and still require it for optimal health. All lenses, both tinted and plain, block some rays from natural light. Each colour blocks certain light frequencies and

reduces the total amount of light that reaches the eye. For most of the year we get up before dawn, work indoors most of the day, and end our workday around sunset. We may even work out in an indoor gym and rely on artificial lights to simulate sun exposure if we experience seasonal affective disorder. Before using tinted lenses as standard daily wear, we may want to think about how much full-spectrum light exposure we are actually getting.

Computers and Eyestrain

I must admit to really liking computers. I was an early convert, purchasing one of the first Kaypro models of the personal computer in the early 1980s and, although this has sometimes been a bit of a struggle, I've tried to stay current. There is no doubt about it, personal computers have made my work much faster and more efficient. I'd never be able to move back to a manual typewriter or adding machine. But even though I enjoy computers, I still seem to notice some niggling little resistance to increasing the time I have to spend on them. Although it makes a lot of sense to convert more and more printed material into computer files, I would hate to give up reading a printed copy of the morning newspaper. I also would have a hard time giving up the pleasurable experience of snuggling up on the sofa with a good book or magazine. Sometimes I wonder if this is just my own knee-jerk reaction to moving into the high-tech age, but I think that the truth is that it is just not as relaxing working on the computer as it is reading a printed page. This is especially

apparent when I am ready to do a final read-through on the computer – I give up and print out a copy which I can read in a more comfortable and leisurely setting.

Generally speaking, optometrists have reported that workers who use video display units (VDUs) have more visual focusing complaints than those viewing printed material, and the complaints increase as the workers spend more hours at the computer. What are the most common problems that people complain about? Researchers E G Godnig and J S Hacunda have documented a list of both direct and indirect symptoms of VDU-induced visual stress in their book *Computers and Visual Stress* (1990), including:

- blurred vision
- colour perception changes
- discomfort with prescription glasses
- double vision
- eye focusing problems
- eyestrain
- headaches
- irritated eyes
- short-sightedness.

The indirect symptoms include:

- back, neck, shoulder or arm pain
- irritability
- increased nervousness
- lowered visual efficiency.

Do any of these problems reflect your own experiences? I've definitely noticed some of these symptoms in myself.

Computer use is very demanding on our visual abilities. G Murch has used laser technology to study visual fatigue among computer users. He found that the eye could not focus on the video terminal with the same accuracy as the printed page. Over a period of hours the computer user's focus point relaxed and extended beyond the screen, causing the screen to appear less clear and harder to read. His findings were published in an article entitled 'How Visible is Your Display?' in *Electo-Optical Systems Design* (vol. 14, no 3, 1982). It appears from this study that the computer image does not provide enough stimuli

to cause the eye to accommodate effectively. Optometrists have found that a few computer users overfocus, which means they are focusing at a point in front of the screen so the image they see is not clear. Other computer users experience a breakdown of eye coordination skills which causes them to see double images after working on the computer for long periods of time. If an individual lacks the visual skill to see the image easily on a computer screen, he may begin to tense his body and move his head in an attempt to focus better. This may lead to posture-related pains in the neck, shoulders or back. Because workers are not aware of ways to reduce computer-induced visual stress, they may make begin to experience job burnout, high absenteeism or visual problems such as short-sightedness or eyestrain.

Why Do VDUs Cause Eyestrain?

1 When using a computer you are refocusing often between the keyboard, the screen and, sometimes, the printed work you are keying in. This requires more work for the eye muscles than just focusing on a book.
2 Older computer monitors have a slow fading phosphor glow which produces some flickering. The flickering image, when it is perceptible, is less restful to look at than a printed page.
3 Often the monitor is not well positioned. The resting position for our eyes is a slightly downward angle. While reading or doing other close work, we usually naturally look down. Sometimes computer monitors are set up to be viewed looking straight ahead, which requires our eye to be less relaxed. The screen may also be quite close to our eyes. Optimally the

computer screen should be positioned from 18 to 25 inches (45 to 60 cm) away, which is further than one would hold a book.

4 Executives report less eyestrain than data entry workers or air traffic controllers who are required to focus intently on the computer screen for long periods of time. Executives usually have more varied tasks and have more opportunity to refocus their eyes at a more restful distance.

5 Computer screens may reflect glare of other light sources which can make the screen harder to see.

6 Laptop computers are very popular because of their portability, but the normal screen image is much reduced to fit the small format. Needing to focus on smaller images is not relaxing for the eyes.

7 People using bifocals may have to raise or tilt their head to read the computer screen if their reading lens is positioned low on their glasses. This may cause neck or back pain.

8 Some type fonts are poorly defined on a computer screen because they have low dot matrix dimensions. This makes them harder to read.

9 Often people forget to blink when they are concentrating on close work. For contact lens wearers, lack of blinking can cause their eyes to become dry. Controlled humidity in office buildings or computer areas may also contribute to this problem.

10 Using a computer may become more difficult for short-sighted contact wearers when they reach 40 to 50 years of age. This is because their internal lens stiffens and makes it more difficult to focus close. Short-sighted contact wearers need to converge their eyes more and focus more than they do when

they wear glasses because the contacts sit on the cornea rather than a half-inch away (as eyeglasses do).

11 It is unlikely that there is any radiation hazard from computers since UV and infrared radiation in sunlight are much greater than the levels present in front of a computer monitor.

12 If you have trouble crossing your eyes, you may have difficulty focusing on a computer monitor because you need to converge your eyes to see close clearly. Exercises involving crossing your eyes can enhance this ability.

You can strengthen your eyes and improve your visual abilities for optimal computer use by doing the exercises in the last part of this book (see page 65).

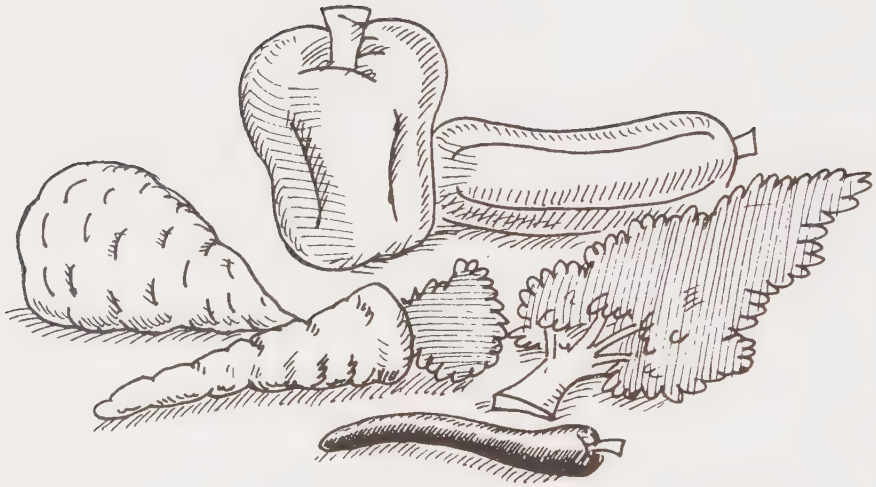
Maintaining Balance

Seeing clearly is part of balancing close work with more relaxed far-focusing. As our work life continues to become more reliant on computers, the proliferation of information forces us to learn new ways to deal with large amounts of data. Most people experience some amount of visual fatigue doing close-up tasks since our eyes were designed for distance vision in natural light.

Optometrists call this strain near-point stress. Just maintaining balance in your viewing activities can play an important role in giving you plenty of visual variety and reducing near-point stress. Locating your desk or computer near a window might help remind you to look up and refocus often. Also the natural light, or as an alternative full-spectrum lighting, appears to play a part in good visual acuity. Another way to increase visual variety is to balance close work with participating in sport or spectator events. Almost all sport events give one the opportunity to track the players, follow the ball, and change focus often. Participation is the best alternative since it allows you to improve your overall body fitness level, not just that of your eyes. It also gives you practice in visual-motor coordination.

Healthy Eating Reduces Risk Factors

New research shows links between good nutrition and a lower risk of cataracts and macular degeneration, the two most common forms of vision impairment for people over the age of 60. Although these diseases are usually associated with ageing, they can and sometimes do affect younger people. Alarming statistics from the US National Eye Institute show there is currently almost a 40 per cent probability of developing eye disease as you grow older, so it makes a lot of sense to do everything possible to minimize this risk.



Eat your greens!

How Do These Diseases Affect Vision?

Macular degeneration is the deterioration of a portion of the retina which progressively impairs the central field of vision. It can drastically diminish vision, but will not result in complete vision loss since peripheral vision is not affected. Macular degeneration causes significant vision loss in thousands of people each year, and there are few treatment options at this time. Nutrient therapy techniques are currently being studied to see if they can be useful in slowing or improving the condition.

A cataract is an accumulation of dead cells in the inner lens, which makes the lens cloudy and obstructs the passage of light through it, creating blurred vision or glare. Low nutrition levels, a build-up of waste products and ultraviolet light can contribute to the formation of cataracts. Cataracts affect more people than macular degeneration and surgical treatment currently consumes a large part of health care budgets. Clinical experience suggests that cataracts are sometimes reversible and may be improved with a program that includes nutrition therapy and moderate exercise.

A High-fat Diet Can Increase Your Risk of Eye Disease

We've all heard about the research showing that a diet high in saturated fat and cholesterol can lead to obesity, atherosclerosis (clogged arteries), high blood pressure, stroke and heart disease. Now a study conducted in Holland shows that people with atherosclerosis, or damaged arteries resulting from a build-up of fatty deposits along the artery walls, were more likely to have age-related macular degeneration.[2]

A professor of ophthalmology at the University of Wisconsin Medical School, Ms Mares-Perlman, has also been studying the links between diet and eye disease. In her study of the farm community of Beaver Dam, Wisconsin, it was concluded that an unhealthy high-fat diet was found to increase risk of macular degeneration by 80 per cent.

A higher risk of developing cataracts has also been linked to the consequences of eating a high-fat diet. Researchers from Harvard University found that being overweight could raise your risk of developing cataracts. The heaviest men in this study were more than twice as likely to develop cataracts as those who weighed the least. This report was published in *Archives of Ophthalmology* (September 1995). A separate study with women seems to support the same conclusion.

Benefits from Eating Fruits, Vegetables and Fibre

A study published in the *Journal of the American Medical Association* by J Seddon of Harvard University concluded that increasing consumption of green, leafy vegetables, in particular spinach and kale, may decrease the risk of developing age-related macular degeneration.[3] A possibly lower risk for macular degeneration was also suggested among people who had a higher intake of foods containing vitamin C. The study included almost 900 individuals and found that those who ate more foods rich in specific carotenoids (lutein and zeaxanthin), which are pigments in fruits and vegetables, had a 43 per cent lower risk of age-related macular degeneration.

According to a study done by Sommerburg *et al.* at the

University of Heidelberg Medical School in Germany (published in 1998 in the *British Journal of Ophthalmology*), corn, orange peppers, red grapes, kiwi fruit, orange juice, courgettes and other marrows are also good sources of the antioxidants lutein and zeaxanthin.

Mares-Perlman's research from the University of Wisconsin Medical School found that people who ate more fibre from breads and cereals had less severe cataracts. She also found that people who took a vitamin supplement had a 40 per cent lower risk of developing cataracts.[4]

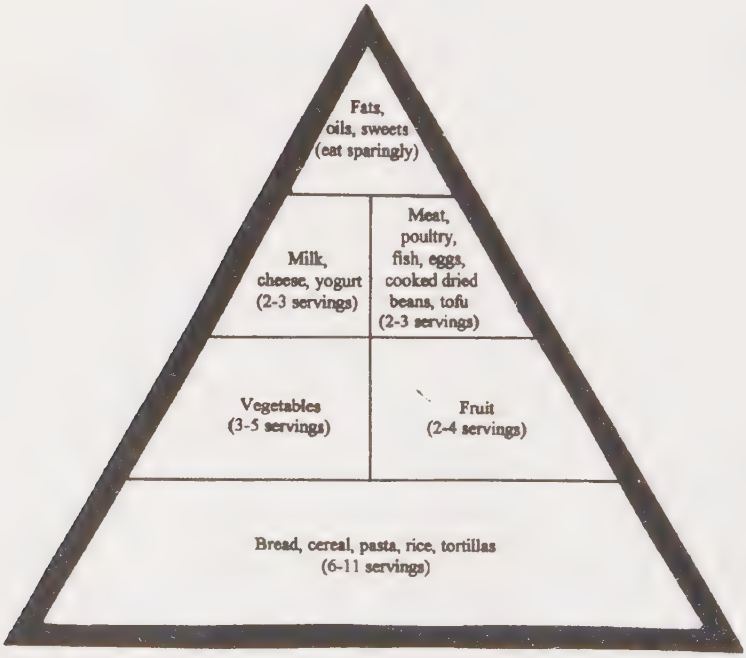
Smoking Increases Your Risk of Eye Disease

Studies in the October 9, 1996 issue of the *Journal of the American Medical Association* states that men and women who smoke 20 cigarettes or more a day are two and a half times as likely to suffer from macular degeneration than those who've never smoked. New studies indicate that even when people quit smoking, they continue to have a higher risk of developing macular degeneration over the next 10 years than non-smokers. Other research indicates that there is also a higher risk among smokers of developing cataracts.

Taking Responsibility for a Healthy Diet

The research consistently confirms the advice that nutrition and dietary experts have been giving us since the 1960s. Eat a balanced diet emphasizing a wide variety of whole grains, fruits and vegetables which are naturally low in fat, contain no

cholesterol and offer potent disease-fighting properties due to the vitamins, minerals and fibre they provide. This is echoed in the recently revised US Department of Agriculture *Food Guide Pyramid*, which stresses that most of our calories should come from whole grains, breads, cereals, fruits and vegetables. Meat, dairy, fats, oils and sweets are shown as smaller parts of the pyramid and should be eaten sparingly. Planning a diet that contains at least five servings of fruits and vegetables each day is also consistent with recommendations from the Cancer Society.



Food Guide Pyramid

The studies cited in this summary support the need for further research on the relationship between diet and eye disease. On-going studies at the US National Institutes of Health (NIH) and other research organizations are looking at antioxidants such as beta-carotene, lutein, vitamins C and E, and other nutrients such as selenium, zinc and copper which are found in the macula of the eye. Although no specific dietary recommendations have been formalized, the studies indicate that you should consider including foods that contain these nutrients in your diet. Some foods which contain the nutrients found in the macula of the eye are:

- dark leafy green vegetables such as spinach or kale
- oranges or other fruits high in vitamin C
- a wide variety of other fruits and vegetables which are high in nutrients, including (but not limited to) carrots, broccoli and tomatoes
- a variety of whole grains, including (but not limited to) whole wheat and oats
- lentils, soybean products, almonds, sunflower and sesame seeds.

Scientists around the world are now finding compelling consistent evidence that a diet with a high intake of fruits and vegetables offers a protective effect against disease.

Make Clearer Eyesight a Conscious Daily Activity

We often take for granted the correct posture of a dancer during a performance, but movement instructors know that this is no accident. Correct body alignment is constantly and consciously practised. All athletes learn that perfect body form, well-balanced muscles and effortless coordination will make the difference between being a winner or loser in competition, and they take advantage of sophisticated computerized measurement systems to analyse their performances. You can use this same strategy in correcting your eyesight. It pays to become more discerning and aware of your own sight distortions.

Vision acuity usually declines at a gradual enough rate, so unless you pay close attention or measure it you are seldom aware of the change until it interferes with your daily activities. If you wear the same glasses constantly you will probably find that you don't know much about the natural capabilities of your eyes. How far away can you recognize someone? Can you thread a needle without your glasses on? What special distortions do you create? Is your vision just blurry or do you see additional lines that aren't there?

Muscles of the body are remarkably adaptable, but they maintain only the amount of mass and strength you need to meet daily physical demands. Fortunately, for most people, good sight requires nothing more than maintaining the muscle balance and coordination we were born with. Daily habits of how we use our eyes may make unclear sight due to irregular muscle form seem permanent, but because muscles are adaptable, when we begin changing our activities, our muscles will

change too. Be sure you consciously challenge those old habits and give your eyes practice every day in seeing something that is now slightly out of focus just that little bit more clearly.

The Subtle Gestures of Seeing

As a student of art, I learned that when drawing a portrait of someone it was important to capture the gesture of the pose. This meant you had to see, and draw, how the action of the pose was expressed by the angle and weight of the body. Always in balance, the action and the body are one. The tilt of the head, curve of the spine and position of the limbs all express a single gesture. If you catch that pose, your drawing becomes dynamic and expresses something more than a head, nose, mouth and eyes.

It was not until I started to improve my eyesight that I started to analyse the subtleties of the gestures of seeing. In my research I read about a connection between posture and eyesight that suggests that poor eyesight might cause or affect poor posture or vice versa. I feel that eyesight and posture develop together as a result of our activities and how we are using our muscles. They are both an expression of the gesture of seeing. Perhaps this way of explaining it can help us see how to reverse the condition by creating the opposite action.

The two basic ways to see include distance focus and close focus. In walking and athletic activity, the head is usually upright, the shoulders and back are straight, the chest is expanded to breathe deeply, our eyes are pointed straight ahead and the ciliary muscle is relaxed for distance focus. We have

good peripheral vision. For close work, the head is usually positioned forward and down, the shoulders are rounded slightly to extend the arms, the muscles of the eyes contract to focus close and point the eyes inward. We are narrowing our peripheral vision.

Moving from one posture to another can naturally trigger the eye to change focus; however, a person with poor eyesight may have lost touch with his ability to change focus effectively and might try to incorporate the opposite gesture. To see into the distance, a short-sighted person may push his head forward and squint, often in a futile attempt to bring things close enough to focus on clearly. A more effective gesture is to pull the head upright and open the eyes wide. This should help to trigger the ciliary muscle to relax and the lateral recti muscles to pull the eyes outward to improve peripheral vision. People who are a little far-sighted or have presbyopia, faced with reading a menu, for example, often pull their head back and lengthen their arm in order to focus better. They may be attempting to create a distance focus. A gesture of bringing the head forward and down and focusing the eyes towards the end of the nose might be more effective in triggering the oblique and ciliary muscles.

Start practising going from one posture to another. At first, you may want to exaggerate them so that you can experience how different they feel. As you learn how to increase the flexibility of the eye patterns, you may also notice that you can reverse the intensity of frown lines, crowsfeet and sagging eyelids.

3

Your Exercise Program

The Basics

1 As Bates proved, the eye is not fixed but is always changing shape to accommodate from near to far vision. The eye, which has perfect sight, is relaxed when it is focused for far and near vision. If you do not have clear sight your eyes may be straining whether you are wearing glasses or not.

2 The brain works in conjunction with the eye, giving feedback that helps the eye bring things into clear focus.

3 Glasses mask the sight problem. The glasses make things *appear* clear so the eye no longer needs to accommodate to the degree that it once did to focus clearly. Coordination and flexibility of the muscles of the eye may decline if the muscles are no longer required to work as hard to see clearly.

4 Exercises help the eye to gain coordination and become more flexible again. There are relaxation exercises and accommodation (adjusting near to far) exercises.

5 In order to regain vision fitness, you need to relearn to see without glasses. However, it is not usually possible function without lenses completely if you have been relying on them for years and need them to drive or work safely. Start by using them only when you need them. Work towards relaxed seeing and being able to function at some tasks without glasses, so that you begin to rely on your glasses less. You can use an old pair of glasses, with a weaker correction, as an interim step.

6 Develop an active interest in seeing clearly and you will begin to notice that even glasses distort things to some degree.

7 Balancing your day between using near and far vision is important. To remain flexible, the eye needs exercise in both areas.

8 Remember to give your eyes breaks from constant close work.

9 Blinking helps the eye change focus and lubricates the eye. Blinking and continually changing focus helps the eye to relax. Staring puts a strain on the eyes. Try to develop the same movements of healthy eyes, blinking and changing focus often.

10 Don't wear distance glasses while reading. Wear reading glasses only for close work. When your eyes read through distance glasses, your eyes must elongate an additional amount to accommodate for the strength of the prescription. When you focus far in reading glasses, your eyes must shorten an additional amount to accommodate for the lenses.

11 Get out of the habit of wearing sunglasses unless you are in the bright sun or are subject to reflected glare, as off snow or water. Sunglasses can make your eyes more sensitive to light. Your eyes will gain flexibility in adapting to bright days.

12 Use the eye chart every day, preferably in the morning, to establish a baseline and monitor your progress or regression. *No matter how long you have worn glasses or how strong your prescription, you can improve your vision.*

Designing a Training Program

1. Devise your exercises to be part of your daily routine. This will ensure that you are incorporating better eyesight into your lifestyle rather than setting up a separate exercise routine which can easily become boring and a chore to do.
2. Start with simple fun things and small challenges to build confidence. Try eating or dressing without glasses. These things you can almost do with your eyes closed.
3. Whether you are short-sighted or far-sighted, determine where the blur zone begins to happen and challenge yourself to keep pushing that limit a little further. This might mean trying to play a game of cards without your glasses, or sitting just a little further back from your TV.
4. Liken eye fitness to other fitness programs such as jogging or weight training. In order to condition yourself to run a mile you have to start with a shorter distance and work up to being able to complete the entire mile. It requires being attentive to the task, and being persistent. You will find that once you begin to rely less on glasses, your eyes will begin to accommodate and will get stronger. The old adage *use it or lose it* also applies to your eyes.
5. Use the eye exercises as additional flexibility challenges.
6. Keep a log or journal to note your victories and your frustrations.
7. Remember that seeing clearly is part of balancing close work with more relaxed far-focusing. Take breaks from close work to allow your eyes to refocus.

8 Incorporate your eye training with sport, hobbies and recreation. Choose something fun that gives you visual practice. Ping pong, soccer, tennis, bicycling, kayaking, spectator sports or going to the cinema can be part of your exercise. If you are riding an exercise bike, use the 20 minutes to focus on the wall chart across the room, try to see yourself clearly in a mirror across the room, or work on improving your close vision.

9 Looking at the eye chart every day is important in monitoring your visual clarity. Check your vision each morning with the eye chart to give you a reference point of how well you are seeing compared to yesterday, last week or six months ago.

10 The real work comes when you are experimenting with your vision. What makes it more clear? What less clear? Better sight is not necessarily a matter of effort, but rather of relaxing and paying attention to how clearly you are seeing. As you develop sensitivity for bringing something that is slightly out of focus into focus, you will develop the skills you need to see better.

Goals

Just as other fitness programs have different levels of achievement, so does eye training. The runner may be content to run a mile, three times a week, or may want to run in competition. Beginning levels of achievement may come about more quickly

and easily than the final push for perfectly clear sight. So even if you have a strong prescription and are sceptical about vision training, you may actually find that just by removing your glasses, your vision automatically improves. As Dr Liberman points out in *Take Off Your Glasses and See*:

> No matter how **weak** your eyesight is, you are very likely wearing your prescription more than you really need to. Most people find that there are very few activities that really require the full prescription that eye doctors are trained to provide, because those prescriptions are based on our worst-case visual need. Do we really need the same prescription to drive in a rainstorm at night as we do to read a book outside on a sunny day? Absolutely not!

Goals for eye training can vary:

- stopping further deterioration
- improving sight and lowering your prescription
- wearing glasses only when driving
- complete effortless sight.

Setting goals can help to motivate you and can improve your progress. As you start finding that you can do things without your glasses, you start realizing that you can take on greater challenges.

Exercises

The normal eye, which has good vision, will be relaxed seeing both far and near with no strain. This means that the shape of the eye is round, and the eye muscles are flexible, strong and well coordinated enough to accommodate for clear vision.

Relaxation Exercises

Relaxation exercises give you an awareness of releasing tension. When eyesight is not clear the eyes are not able to be as relaxed, and seeing is more of a strain. Think about relaxation not as rest but as reducing strain. Even in sleep our eyes are not necessarily relaxed because dream patterns keep our eyes in movement.

I would like to draw an analogy between building vision fitness and strength training. The weight-lifter who builds his muscles gradually, so that he is actually relaxing into a lift rather than straining or jerking, is in control at all times and can easily do an exercise without injury.

Accommodation and Coordination Exercises

As with any other fitness program, you have to push your level of fitness or flexibility by daily being aware of how clear or unclear things appear. In myopia you tend to overfocus – you need to learn to relax the ciliary muscle and perhaps use the recti to pull the cornea flatter. In far-sightedness you are underfocusing – you need to relax the recti, which flatten the cornea too much, and develop coordination of the oblique and ciliary

muscles. Both near and far vision can show improvement by doing the exercises and paying attention to how clearly you are seeing.

Balance

The third part is balancing your activities to give your eyes a chance to use all of their powers every day. This will not only help your eyesight but will ensure a more balanced lifestyle.

Chinese posters in factories and schools recommend massaging at acupuncture points (as defined in Traditional Chinese Medicine) to stimulate circulation.

1 Using your fingers, massage under the bone ridge at the inside corners of the eyebrow.

2 Using your index fingers, massage the bridge of your nose.

3 Place your index fingers on your cheekbones, approximately one finger's distance from your nose. Message gently.

4 Massage outwards along the brow bone and under your eye along the bone ridge to the outer corner of your eye.

Relaxation Exercises

Bates included these types of exercises in his books. The objective of these exercises is to reduce strain and tension in the eyes and body.

COVERING EYES WITH PALMS

Rub your hands together to warm your palms. Close your eyes and place your palms over your eyes. Your hands should rest lightly on the bony ridges around the eyes, but should not touch the eyelids.

RELAX IN THE SUN

Find a comfortable place to sit in the sun. Close your eyes and feel the light warm your eyelids. Allow yourself to relax and enjoy the experience. If you like, you can also move your head from side to side to relax the neck muscles.

RELAXED MOVEMENT

Stand with your feet slightly apart. Rhythmically rotate your body, twisting so that your head and shoulders are looking from side to side. Let your arms swing in a relaxed manner at your sides and keep your eyes open so that the world appears to be spinning slowly past your gaze. Allow your whole body to relax.

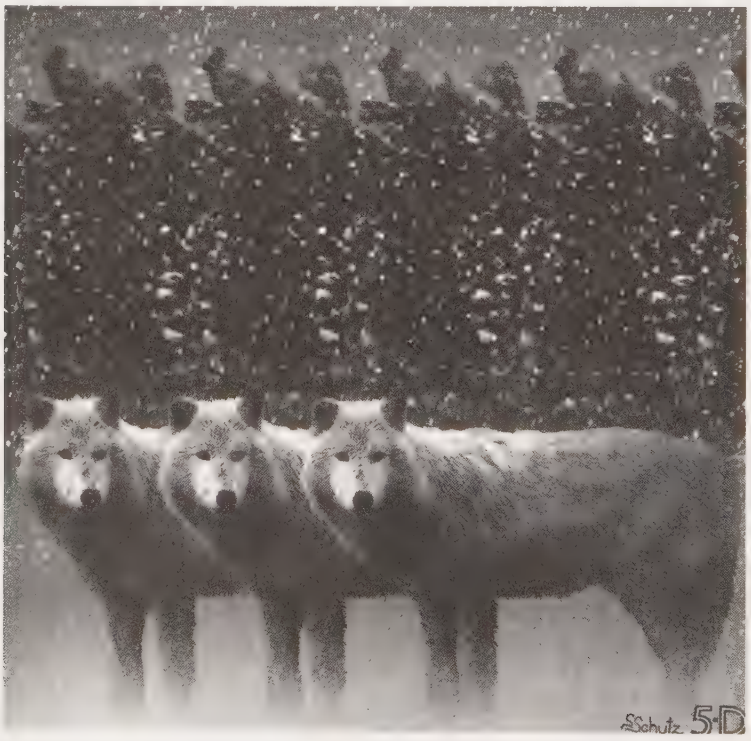
LOOK OUT THE WINDOW

I find that my eyes relax instantly if I go over to a window and look out into the brighter full-spectrum natural light.

Why Relaxation Works

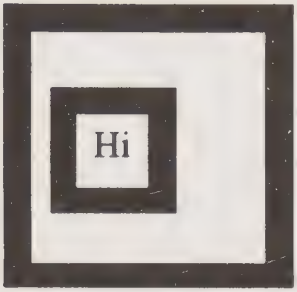
Muscle tension associated with close work usually plays a part in why people begin wearing corrective lenses for short-sightedness, far-sightedness and astigmatism. By learning to let go and release the tension, you free up the eyes to be flexible so they can more easily respond to automatic focusing reflexes.

Stereograms have recently become popular. These are two-dimensional pictures that strangely appear three-dimensional when you relax your focus. See if you can see the hidden 3D picture in the stereogram below.



To see this hidden image, first focus your eyes on something across the room. Without losing that focus point, bring the stereogram in front of your face. Slowly move it away from your eyes. The image may be a little blurry at first, but your eyes should gradually find the stereogram's focus point.

HI SQUARES – (MYOPIA, HYPEROPIA, ASTIGMATISM AND PRESBYOPIA)



The hi-squares exercise is effective for both far-sighted and short-sighted problems. There is a connection between the crossing muscles and the focusing muscles. If you are far-sighted you are underfocusing; if you are short-sighted you are over-focusing. This exercise helps your coordination.

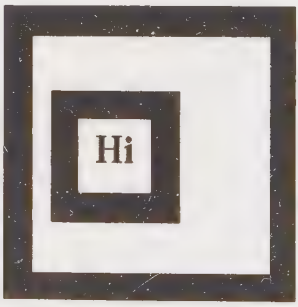
A similar exercise was recommended in both Dr Hutchinson's book Computer Eye Stress, How to Avoid It, How to Alleviate It, and in Dr Kaplan's book Seeing Beyond 20/20. I don't know where it actually originated.

Hold the squares a comfortable distance from your eyes. Cross your eyes slightly so that three squares appear on the page. Adjust your vision until you can read the word 'Hi' clearly in the centre. Notice that the centre appears to recede.

Once you master the eye-crossing phase, you can try doing the exercise using your far vision. This time look into the distance and bring the squares up between your eyes and the distant object of your focus. Keep your attention focused far away. You'll again notice that a third square appears on the page. Adjust your sight until the middle square is clear. The centre should appear to advance.

If you have mastered the exercises above, try doing them again, but this time try moving the page towards you and away from you while keeping the middle circle in focus.

VARIANT ON HI SQUARES – (MYOPIA)



This exercise is a variant of the Hi Squares exercise; however, I have modified it slightly so that it becomes more effective for those working with myopia. This exercise helps train the eyes to use the crossing and focusing muscles together for distance.

First learn how to do the Hi Squares exercise comfortably so that you can create the third square both while crossing your eyes and using your far vision. You must also be able to hold the visual image while moving the paper closer and further from you. If you can, you are ready to expand the exercise by increasing the distance.

Tape this illustration on the wall next to the eye chart. Now perform the exercises while stepping back from the chart. Hold the image. You should do both crossed and far-focus. You can access far-focus by touching your nose on the page between the Hi Squares and then stepping back. Learn to blink while still holding the image so that you can give your eyes a break when needed. It is possible to step back 20 feet (6 m) while still holding the image. As you train your eyes to work together moving further and further from the wall, you may begin to see that after doing this exercise the eye chart is much clearer. (If I have been doing close work and find my sight blurry, I can immediately improve my far-focus by doing this exercise.)

CONCENTRIC CIRCLES EXERCISE – (ASTIGMATISM)

This exercise helps you see your whole field of vision at once, making you aware of how you are distorting parts of the image. Astigmatism affects how you see horizontal or vertical lines. Working with the image to bring it all into clear focus increases your flexibility. At first it may appear that there are diagonal lines or breaks in the circle, but by simply relaxing your gaze you may notice the image change.

If you have astigmatism, you will notice that the bull's eye becomes distorted at a distance. It may have lines through it and begin to look like a kaleidoscope at a distance instead of appearing as a series of increasingly larger continuous bands of alternating colour.

Stand where you can comfortably see the centre clearly and notice that the concentric circles continue all around the circle. Now move back to where the circles begin to break. Try to relax and adjust your focus to bring the centre of the chart into clear view. Keep moving into the blur zone and bring the chart back into clear view. Another thing you can try is focusing on a band near the outer edge of the circle and moving your eyes around the circle, trying to see the continuous coloured band through the breaks. It may seem impossible to move through the breaks at first, but once you do you will find that your vision becomes far more flexible and you will soon be able to clear the circle easily.

Post this exercise next to your eye chart so you can look back and forth between the two charts as you work. This way you can check clarity on both of the charts.

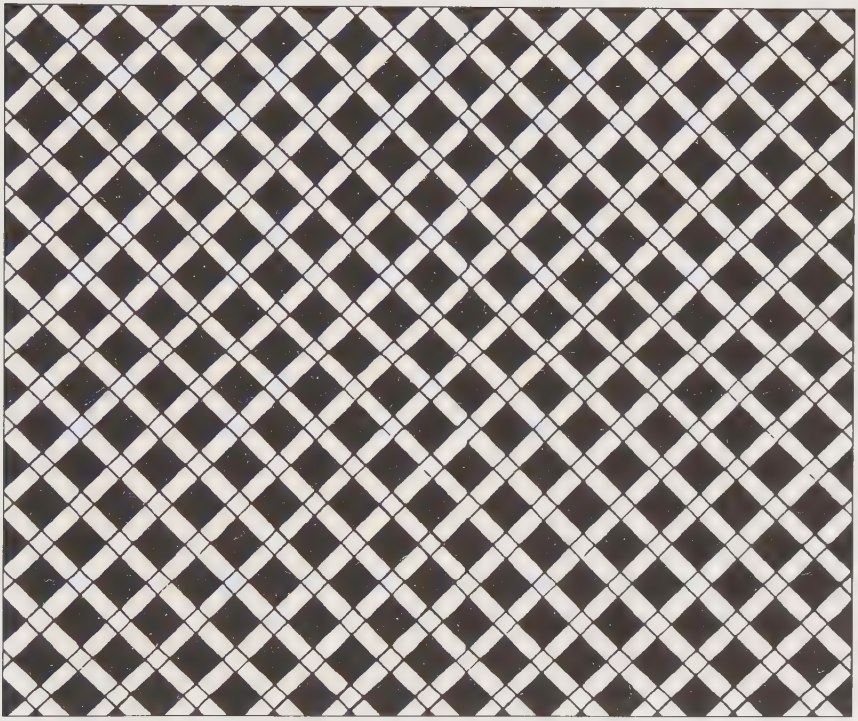
DIAGONAL LINES EXERCISE – (ASTIGMATISM)

One day I noticed that I had trouble seeing diagonals. If a sign contained the letters V, N, S, M, etc., at a distance the diagonal lines would bunch together and fade out, and I consequently had a hard time reading them. This eye exercise is similar to the bull's eye exercise and helps you to see how your field may be distorted. The objective of this exercise is to help you to practise adjusting your sight so that the white and black lines appear equally uniform in size, and are sharp and clear. Practise with each eye individually and then both together.

Stand where you can see the diagonal chart clearly. Then move back and see if the chart starts to distort. Can you continue to see the white lines (nice and fat) as if they were threads running through a woven piece of burlap? Can you see the diamond shapes black and clear in the background?

An eye doctor once told me that my eyes tended to look inward slightly (towards my nose). I've found when I practise looking at the chart, one eye at a time, that by moving my focus more towards the outside corner of my eye the diagonal lines became less distorted. After practising with the chart for a week, my coordination dramatically improved. I no longer had to exaggerate the movement; I began to focus in on the diagonals easily.

Use this chart to train your eyes to see the images clearly without distortion. This exercise might also help you to clear up the blur zones in the bull's eye.

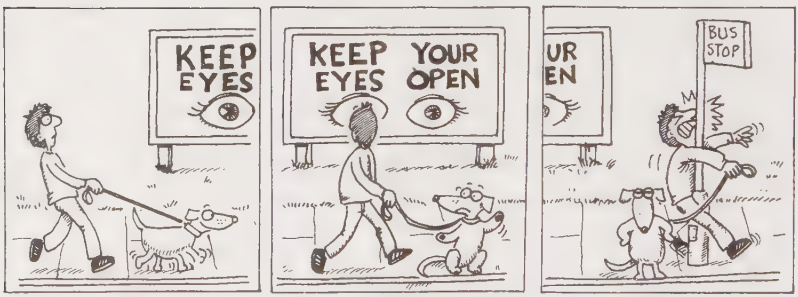


GO OUT FOR A WALK – (SHORT-SIGHTEDNESS AND ASTIGMATISM)

The objective of this exercise is to concentrate on seeing clearly as you keep moving your eyes from object to object. To do this exercise, go out for a walk, or if you have only a minute or two you can look out of a window.

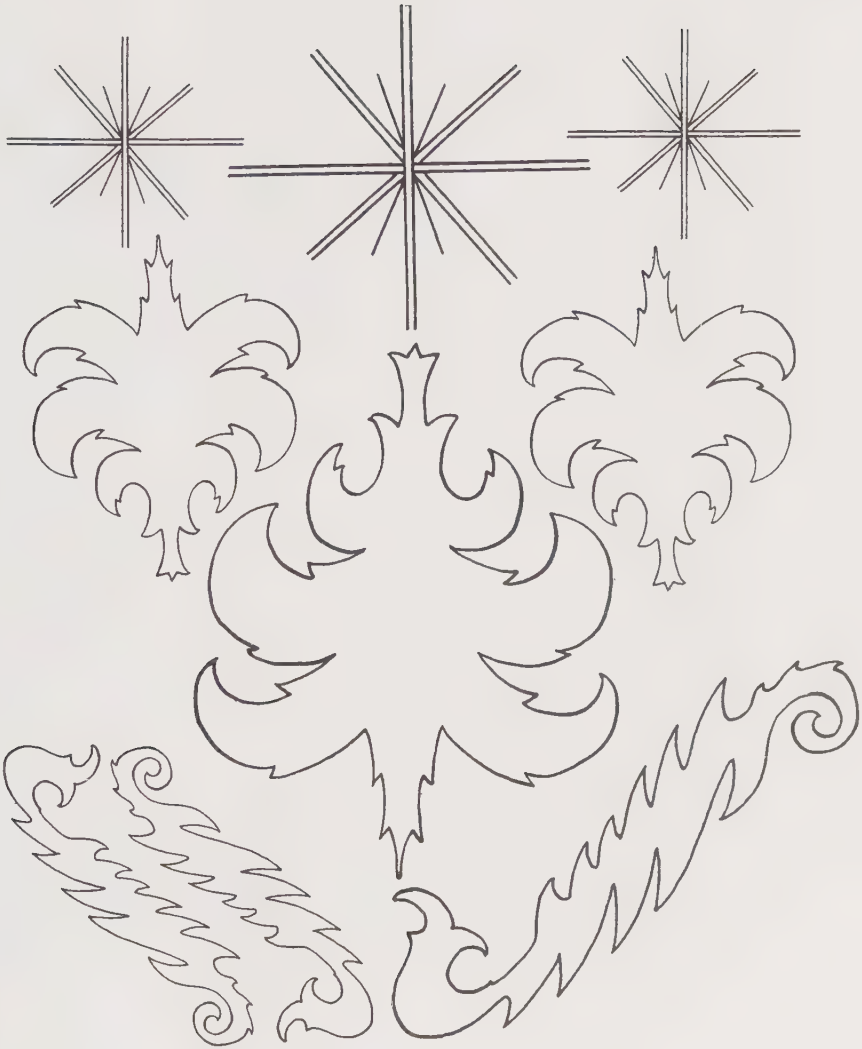
Look at each flower. Read the number plates on parked cars. Trace the edge of a roof up the peak and down. Read the house numbers. Look ahead at cars at a junction two streets away. Read the road signs and any other posted signs along your way. Enjoy every aspect of your walk and have a good time!

I hope you find this to be a freeing exercise. Remember to try and focus as clearly as possible, but keep your eyes darting from one object to the next.



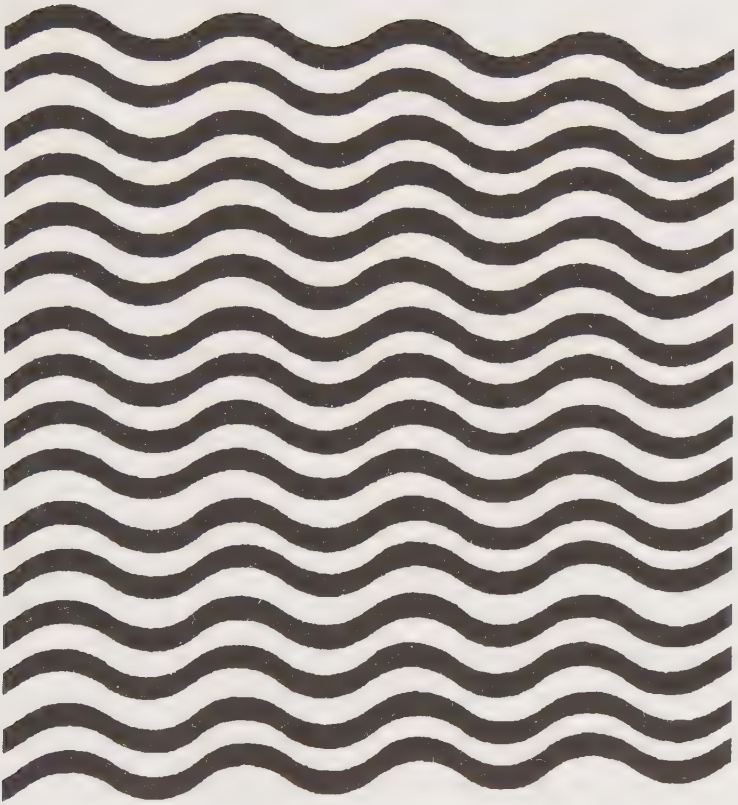
BLACK LINES – (SHORT-SIGHTEDNESS AND ASTIGMATISM)

Place page 85 just outside of your clear focus and into your blur zone. Look at the black outlines of these forms. If parts of the outline are unclear, follow the line around that part of the design while relaxing your eyes. See if you can make the unclear parts appear as clear and distinct as the other lines of the form. Try this with each eye separately, then both together.



THE WAVE - (SHORT-SIGHTEDNESS AND ASTIGMATISM)

Place page 87 somewhere in your blur zone. Look at the page and see if you can see the uniform wave pattern running across the page. Both white and black lines should look the same width and be continuous. You may want to move the page more or less into your blur zone. Work at seeing the waves clearly with each eye. Try to make the contrast of black and white richer. Now turn the page so that the lines run up and down. Check to see if it is easier to see the waves in this position.



CLEAR THE O – (SHORT-SIGHTEDNESS AND ASTIGMATISM)

The object of this exercise is to practise intensifying the clarity of the letters.

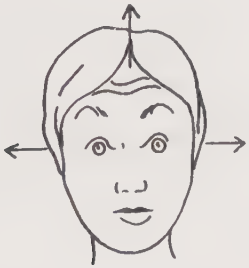
n o p q r

Place this page far enough away so that the letters are slightly blurry. Working with one eye at a time, look at the inside of the 'O' and notice that it is greyer than the area outside the letters. Try to 'lift the veil' over the 'O' so that the space inside the letter is as light as the white area at the edge of the page. It may help to think about relaxing and opening up the inside of your eye. Keep practising daily until you can make the centre of the 'O' white.

When you are able to do this you can also experiment with making blacks blacker. I practise intensifying blacks after I have been focusing far for a while (like when I'm watching TV.) When my eyes become adjusted to seeing the TV clearly, I glance over to the eye chart on the wall and try to make the black letters even blacker. Once they start intensifying the black, I think of relaxing and letting the letters get even darker.

EYEBROW LIFT – (SHORT-SIGHTEDNESS, ASTIGMATISM, FAR-SIGHTEDNESS AND PRESBYOPIA)

Coordination of the eye is complex. Some muscles relax while other muscles contract as one changes focus. The object of this exercise is to become aware of the sensation of flexing and relaxing muscles around the eye by creating exaggerated movements.



Begin by lifting your eyebrows so you feel tension across the front of your eyes. Then relax. (It should feel like you are doing isometrics by flexing the muscles underneath the skin and then releasing the tension.) Now tighten the muscles along the upper cheeks, creating tension as if you were pulling the muscles taut on the sides of your face. Relax. Do a series of each exercise and try doing both at the same time. You can make this movement even more complex by looking up then down and from side to side as you progress.

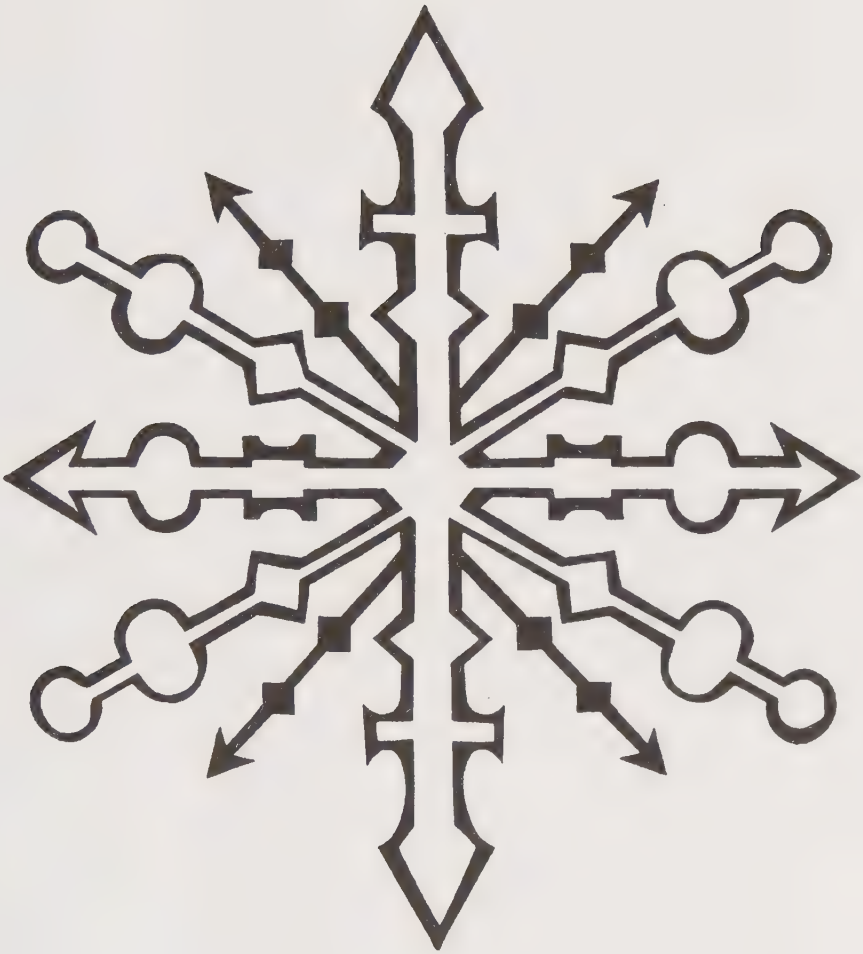
Over time you may notice when you are creating tension or relaxing, and how this improves or decreases your clarity of vision. You may also notice small pulls and tugs around your eyes as your flexibility increases and your muscles begin to react automatically to finer focusing. I noticed that lifting my eyebrows seemed to help develop my ability to see far.

SNOWFLAKE – (FAR-SIGHTEDNESS, SHORT-SIGHTEDNESS, ASTIGMATISM AND PRESBYOPIA)

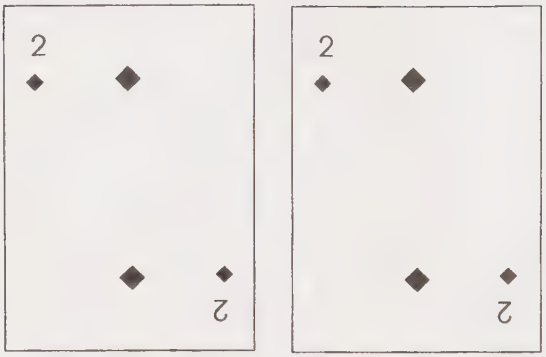
Hold the image on the opposite page at the distance where it starts to blur. Relax your eyes as you slowly trace around this intricate design. The objective is to concentrate on seeing a clear edge while moving your eyes around the pattern.

For far-sightedness and presbyopia, do this exercise daily. Every few days move it a little closer to increase the challenge.

For short-sightedness and astigmatism, do the exercise daily and every few days hold it further away. If the design is clear when held at arm's length, hang it on the wall and keep increasing the distance you stand away from it.



CARDS – (MYOPIA)



A similar exercise is recommended in Dr Hutchinson's book *Computer Eye Stress, How to Avoid It, How to Alleviate It*, but I have also seen it demonstrated by Dr Kaplan. The objective of this exercise is to train your eyes to focus while learning to move the eyes outward away from your nose. For reading, the eye muscles strengthen to point inward and focus together. This exercise gives you practice in coordinating and strengthening the muscles to focus the eyes outward for distance.

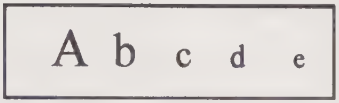
Look at something across the room, then bring two identical cards (use two cards as shown above, but with the space between them cut so you can hold one card in each hand) up in front of your vision, without changing your focus. Notice that a third card appears in between the original two. Bring the third card into focus so that it is identical to the original two images. Try to hold the third card in focus as you move the cards closer to you and then away from you. Now see how long you can hold the image of the third card as you begin widening the distance between the two cards.

FINE PRINT – (HYPEROPIA AND PRESBYOPIA)

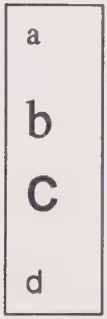
The objective of this exercise is to practise focusing on print.

Start by working with a type size that you can read without glasses. Look at the white space inside the letter and try to make it whiter and clearer by relaxing your eyes.

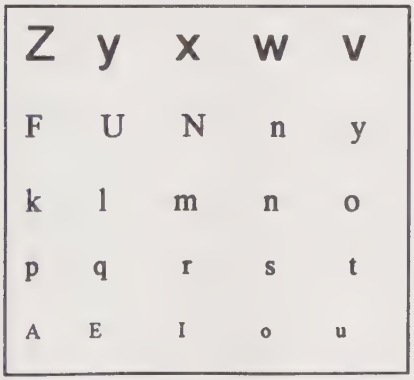
Trace around the border of the box, then go back to the letter and try to bring it into clearer focus.



Move to a smaller letter or bring the page closer so the type slightly blurs. Try to bring the slightly blurry print into clearer focus. Look back at a larger letter.



Cover one eye with a card or your hand and work on one eye at a time. When you lose focus, relax your eyes by looking at something across the room and then refocus on the print. You can also relax by moving your eyes along the white space around the letters.



Remember to take breaks from reading and look up often to refocus. Long periods of close work cause near point stress for all eyes.

If you have difficulty crossing your eyes for the Hi-Squares exercise (page 75), you can improve your convergence skill by doing this exercise.

Hold the Jogger at a comfortable distance so that you can focus clearly on it. Slowly bring the Jogger closer to your nose while continuing to maintain clear focus on the image. See how close to your nose you can move the image before it breaks into two images.

FLASHLIGHT EXPERIMENT

The object of this experiment is to demonstrate how the eyes must converge more to focus close.

To do this experiment, use two flashlights that can be adjusted from floodlight to spot light. Set them on spotlight. Hold the flashlights within 1 foot (30 cm) of the wall and angle them inward so the beams of light converge on the same spot. Now start moving back from the wall several feet while holding the flashlights the same distance apart. You will notice that as you move back you must straighten the flashlights to keep the beams of light focusing together on the wall. Usually if a person has trouble seeing clearly, he has a problem with convergence. Often the far-sighted person cannot easily converge to focus close, and a short-sighted person may over-converge while trying to see far.

ADVANCED EXERCISE – (FAR-SIGHTEDNESS, SHORT-SIGHTEDNESS, ASTIGMATISM AND PRESBYOPIA)

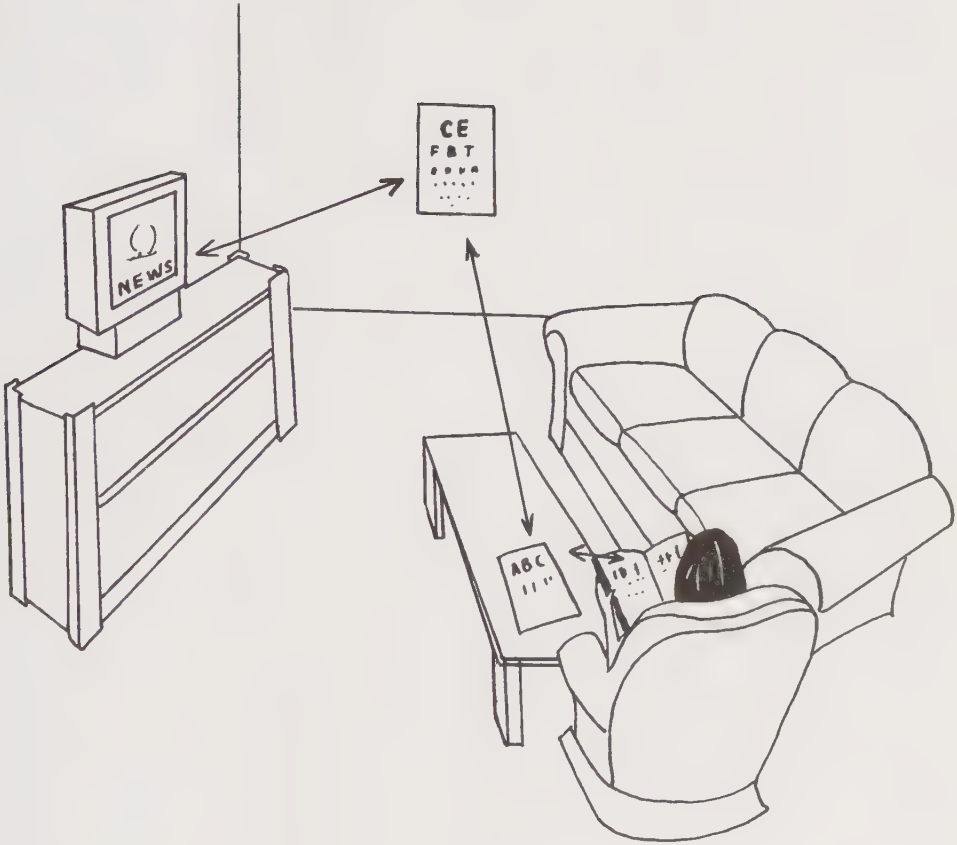
The object of this exercise is to give your eyes practice in automatically adjusting focus from near to far.

This exercise is all-encompassing and will give you good practice in automatically adjusting your focus. It is also a difficult exercise and will tire your eyes quickly. The exercise will be most effective if you concentrate on working just in your blur zone and with letters or graphics with sharp angles so you have distinct detail. If you work too much into the blur zone, your eye will not be able to distinguish any detail and will not respond as well.

Sit comfortably in a chair with some reading material. Place a book or magazine with type on the table in front of you. Position the eye chart or some other written type on the opposite wall. Make sure all type is big enough to see at least as a fuzzy but distinguishable outline. Now focus on the type you can see with crystal clarity, then move your eye to focus on the next clearest type and let your eye bring it into clear focus. If you can't bring it into focus, move the type a little until you can go back and forth rapidly. When you can do this, shift your eyes to the type that is least clear and let your eye bring it into focus. Keep going back and forth between the three distances.

At some point you may notice that you bypass your thought process and your eye suddenly adjusts to all three distances. You are really challenging yourself to work quickly and automatically.

Give yourself a reward after doing this exercise.


NEWS
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ABC

PATTERNS – (FAR-SIGHTEDNESS AND PRESBYOPIA)

Try bringing the patterns on page 99 into focus with each eye separately, then both together.

Start with the designs at a comfortable distance and move them closer to make it more difficult. If you lose the focus, move the paper further away and start again. You can find your own interesting designs to work with, or try an amusing cartoon.

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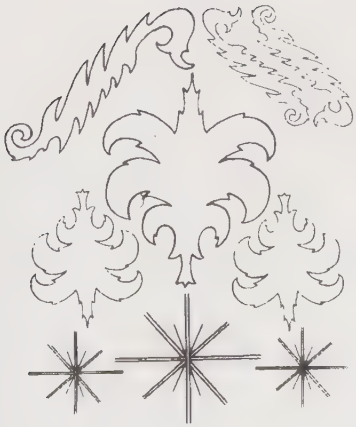
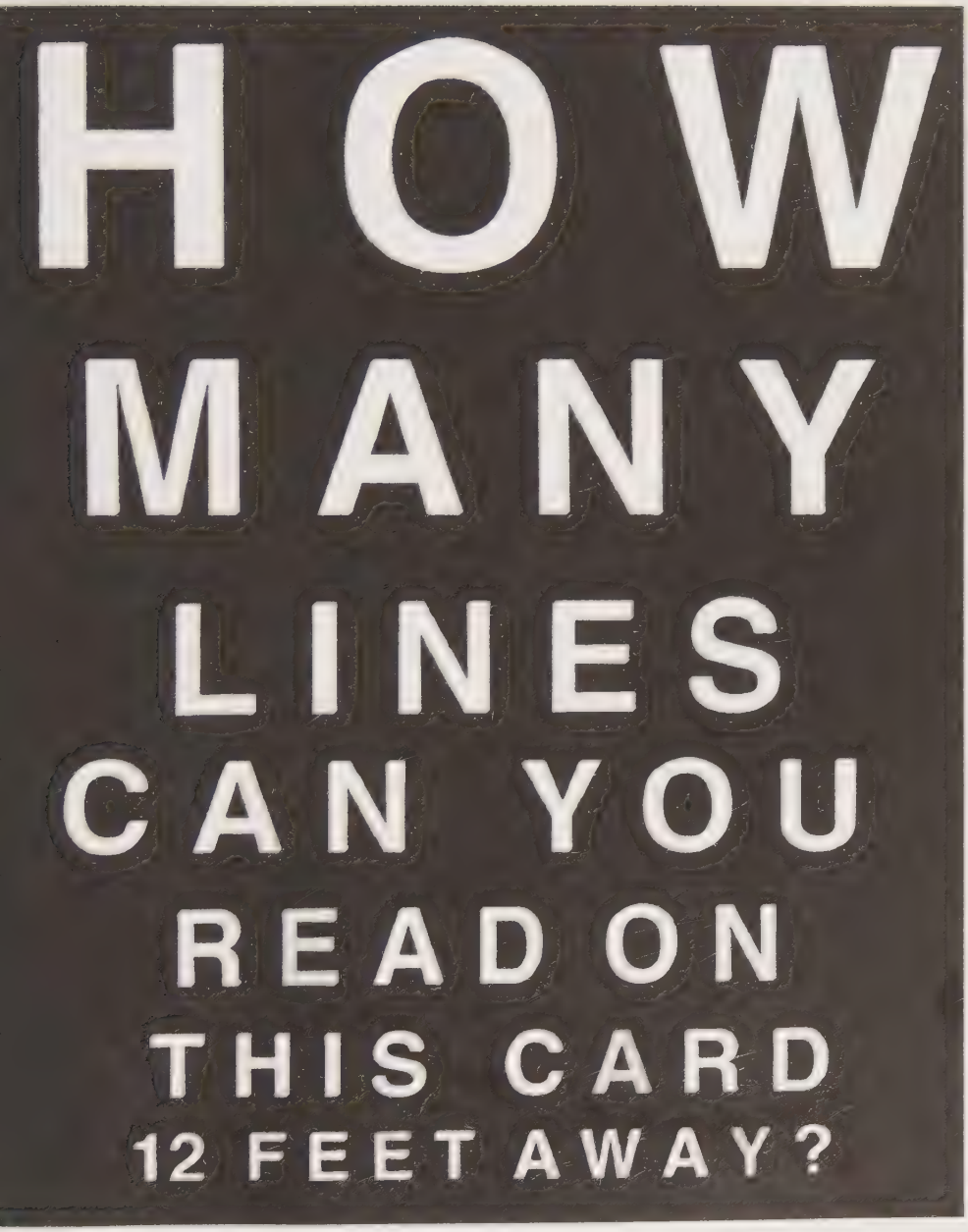


WHITE LETTERS ON BLACK

The lines of type opposite are the same size type as the letters on the distance acuity chart. Because of the contrast of white letters on the black background, you may find this sheet easier to read than the distance chart. Try it and see.

You can refer back to the distance chart to determine which lines correspond to the 20/100 through 20/20 lines.


HOW
MANY
LINES
CAN YOU
READ ON
THIS CARD
12 FEET AWAY?

Additional Available Aids

Biofeedback Training

In the 1980s, Dr Joseph Trachtman invented and patented the Accommotrac vision training device to help cure myopia. It is a biofeedback machine that makes a noise to inform a person when the ciliary muscle relaxes, which can in turn improve distance sight. The Accommotrac is available through many vision therapists. The training has proved effective and is now being used to cure many other visual problems in addition to myopia; however, it is more expensive than the books and other methods that I have included herein.

Lenses as Resistance Training

Brian Severson, an engineer and pilot, has devised an ophthalmologist-approved method using lenses as a resistance force (like weights) to strengthen the eyesight.

Brian's dream was to become an airline pilot. In order to be competitive in his desire to work for a major airline, he needed to obtain a university degree. Unfortunately the amount of reading required to get his engineering degree worked against him. Although he practised good vision habits, he became shortsighted and was unable to pass the 20/20 vision test which was required of would-be pilots.

Brian did not give up. After years of research he developed a technique using reading glasses as resistance to strengthen his

distance sight. He became a pilot for United Airlines, and now markets his course to help others achieve better vision.

I have used his *Vision Freedom* method and found it very helpful in correcting my sight. He originally was working on a cure for his own myopia, but has found the same principles apply to other visual problems. I would recommend this method as an additional option in your quest to become less dependent on glasses. Brian has a patent pending and sells a reasonably priced kit that includes a book describing his techniques. I have included his address and website address in the Bibliography.

Behavioural Optometrists

Behavioural optometrists have written several of the books listed in the Bibliography. Their roots go back to the turn of the century. They have carried on the tradition of vision improvement through the use of education about lifestyle, nutrition, the proper use of glasses and the practice of visual exercises and psychologically-based drills. These methods may be able to assist you with vision correction techniques. In the US, approximately one-eighth of practising optometrists are behavioural optometrists.

Student Observations and Suggestions

I developed this book as a learning tool to use in a course I taught in an evening community education program. I've learned a lot from the participants' comments about their experiences. Here are some of their observations.

One night a male university student mentioned that his studies forced him to stare at equations when he was working on mathematical problems. He wondered if there was anything he could do about this. Another student in the class suggested that he get a chalkboard or a magic marker board so that he could write out the equations in large print. Then he could sit across the room while pondering the solutions.

One woman found that her distance sight improved when she returned to university after working for a few years. She felt that the daily time she spent in class looking at the board or viewing an overhead projection was making the difference. This practice of far-focusing was giving her the varied visual movement that she did not experience in her job.

Before attending my class, one young woman had been practising relaxation techniques, but had found that her progress had stalled. She especially liked the Concentric Circles and the Diagonal Lines exercises since they gave her some specific visual feedback and offered her a new way to address her distorted vision.

One student decided to take my advice and walk around campus while resting his eyes. He said that after he finishes studying his distance sight is sometimes noticeably blurrier than normal, but that after a short while his normal acuity usually returns. He was hoping to learn how to retain his good eyesight. He's taken a big step by just becoming aware of how he sees and what affects his ability to see.

During the first session of my classes I usually have the students describe why they chose to take the class, as a way for the students to get to know each other. One woman mentioned that

she had been wearing glasses since junior school for short-sightedness. She said she wore her glasses all the time. When I suggested that she try to read without wearing her glasses, she expressed concern about getting headaches. I encouraged her just to try it for a few minutes at a time. Two weeks later the woman mentioned that she was elated at the change in her sight. She had been reading without her glasses, and since she had been monitoring her distance sight with a chart, she was amazed that she saw a noticeable improvement in her distance vision. She hoped that she could continue with this.

If you are short-sighted, your eyes have to accommodate over your distance prescription in order to read. Thus if you continue to wear your glasses for close work, you tend to strengthen your eyes in the wrong direction. By taking your glasses off and moving the book further and further away you start emulating the habits of a far-sighted person.

I noticed also that when I stopped wearing my contacts, which corrected for distance, even my computer screen was blurry. Since I was already experimenting with my distance acuity, I decided to see if my eyes would accommodate to this near-point blur as well. Within a week my eyes had already accommodated to clear up the computer screen. Now I still practise this concept and work with my computer screen further away.

When I started to improve my distance vision I noted that the eye chart was blurry at 12 feet (4 m) but also that type on my computer was blurry and everything in between was blurry to some degree. After a while I recognized that I didn't have to be 20 feet (6 m) away from a chart to work on my distance

vision. I could work on small type at arm's length, my TV screen at 10 feet (3 m), or anything in between that was noticeably distorted.

Letters or geometric lines and curves are good to work with since they give you a good indication of visual clarity.

Putting It All In Perspective

Everyone has a right to participate actively in decisions regarding their own eye care. Fortunately more and more information is becoming available concerning the benefits of vision therapy techniques. You have already demonstrated that you are very motivated to learn more since you have read this far in the program. I want to commend you on your persistence, because it is really up to you to take responsibility for maintaining your eyesight so that it can last a lifetime. Based on your own observations, you may have already come to the conclusion that just relying on 'corrective' lenses usually leads to needing stronger lenses later, and never addresses the underlying problems. *EyeRobics* gives you the tools you need to learn some techniques that can help you to relax muscle tension and develop flexibility and coordination so that your eyes work more efficiently for you. *EyeRobics* incorporates a process similar to other fitness programs such as dieting and weight training. You begin by first understanding what influences vision, and then you learn how to change your habits and behaviour so that, over time, your condition improves.

Knowing you have some control is an important first step. Since nutrition and overall fitness play a big role in maintaining healthy eyes, planning a general fitness program emphasizing diet, physical exercise and vision training can be a truly winning combination.

I encourage you to try working with *EyeRobics* for a month and 'see' what happens because – *Seeing Is Believing!*

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Chapter 2

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IT'S TIME TO LEARN HOW TO RESTORE YOUR SIGHT NATURALLY

It is an outdated belief that sight deterioration and the need for glasses is inevitable as we grow older. Not only can eye health be maintained but deteriorating eyesight can be improved.

In our drive to keep fit, we tend to ignore the eyes. Marilyn Roy shows people how to improve their vision fitness with simple exercises to both stimulate and relax the eye muscles. She details the symptoms of eyesight problems, such as myopia, astigmatism and hyperopia, and also considers the problems of computers and close reading, offering practical suggestions for avoiding eyestrain.

EyeRobics® introduces techniques, visual games and charts to strengthen your eyes and reduce dependency on glasses or contact lenses.

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