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THE PRACTICE OF MODERN OPTOMETRY

BY

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DEDICATION

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To the officers and members of the American College of Optometrists and all progressive thinkers in the Optometric profession this volume is respectfully dedicated.

--The Author

INTRODUCTION

Blazing a new trail in the thinking and proceedure of any profession entails new terms, definitions, and often seemingly strange expressions, readily condemned by those who prefer to follow the beaten path; and heralded as the dawn of a new day by the more progressive thinkers.

Although, it has been an arduous task, the thought of producing something which might be of benefit to many colleages, and eventually to humanity at large, has brought with it a certain measure of enjoyment.

The main purpose of this arrangement in loose leaf form and beginning the first page of each chapter with number one, is to permit the insertion of additional material from year to year. This is only an humble beginning in a new direction and continued research will be required in the future to develop elaborations on various phases of the procedures.

For practical purposes as an office guide, I suggest that, after the examination has been completed, the practitioner determine whether it is a case of hyperopia, myopia or orthophoria; then ascertain whether it is esophoria, exophoria or orthophoria.

Assuming that the case is one of hyperopia with esophoria, the basic classification is "E". Next, does the patient have discomfort and/or lowered visual acuity? If so, the small letter "a" and/or "b" are added. Should this be "E-a", the case is one of hyperopia with esophoria and ocular discomfort. This classification is case #14 in the third chapter. Now turn to case #14 in the fourth chapter and note what is offered regarding the background causing that type of syndrome in relation to age, sex and environment of the patient under consideration. If this coincides with the patients history and complaint, turn to case #14 in Chapter 5, study the variations and employ the indicated procedure. After that has been accomplished, and additional reconditioning is required, consult the technique given under Case #14 in Chapter 6.

In that way, any practitioner may readily become accustomed to the reasoning and practical application pertaining to this new approach to optometric problems.

In the early years of my practice, hardly a day passed without problems for which a silent partner with years of practical experience would have been a welcome guest. With that in mind, the principles and techniques advanced in succeeding pages are presented to the optometric profession.

William Henning, N.D.,Opt.D.,F.A.A.O.
4544 Hazel St.
Chicago, Illinois
December 29, 1938

FOREWORD

To offer in print an entirely new philosophy which shatters many theories of long standing and also describe specific techniques which differ radically from those in common use, requires a power of conviction seldom attained except by those who are placed in an advantageous position. My good friend, the author of this work has dared to take this initiative without special advantages or support from recognized institutions. He went directly to the practitioners in the field where these new principles and techniques could be applied in every day practice.

The methods described herein have been applied in my own practice of Ophthalmology during the past two years and I can conscientiously state that the entire procedure has been a real revelation to me. The practice of Optometry on this basis I believe will be a boon to humanity and should be welcomed by other practitioners as a very important supplement to their particular realm of endeavor. My personal experience with the various techniques has been such that I am convinced of the soundness of the new principles advanced, astounding as they may seem at first.

Perhaps the most difficult part is that of suddenly throwing one's thinking apparatus in reverse. This new approach is at first somewhat confusing, but the extreme effectiveness and astonishing end results, soon dispel all doubt, and within a short time it is found to be the simplest and most concise method ever offered to the refractionist. That promising and almost virgin field of "Preventive Optometry" alone is sufficient to warrant the necessary study to comprehend and master the techniques.

Owen H. Yerman, M.D.
2033 Woodward Ave.
Detroit, Michigan

RECOMMENDATION

During my thirty-five years of medical practice, I have watched the growth and development of Optometry from spectacle vending to a highly scientific and dignified profession. It has always been my firm conviction that the field of refraction and the care of functional ocular disturbances comprise a domain for which a new type of specialist was yet to be developed.

Until two years ago, I felt that it would require many more years for such a group to become a reality; but with the appearance of this treatise, I believe the modern Optometrist applying the methods herein described, will qualify for that position.

This is the first time I have seen a presentation in Optometric literature, from the standpoint of reasoning and interpretation of ocular symptoms, which seems to coincide with my experience in the practice of medicine. It is very unusual to find a composition pointing in a new direction, so completely developed in detail as this one; enabling any Optometrist to apply the entire procedure in chronological order without personal instruction.

I sincerely hope that this book will attain wide circulation so that humanity may be benefited by the application of the teachings herein set forth. The great need of relief from ocular discomfort is rapidly becoming paramount; and here we have well developed, clear cut, practical basic principles of "Preventive Optometry" presented. God speed this teaching.

Harold J. Hoover, M.D.
316 Harrison
Grand Ledge, Michigan
December 29, 1938

CONTENTS

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CHAPTER ONE

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Explanation of the essential differences between prevailing concept of Optometric procedure and the new concept based on our twelve fundamental principals advanced in the Educational bulletin number one.

Chapter One

BASIC PRINCIPLES

Since the purpose of this volume is to supply the practitioner with a practical office guide, based on a new concept, I submit the following principles to be considered as fundamental in this work:

(a) That nearly all ocular discomfort and pathology is the result of general psychophysiological disturbances which may be intensified by local demands.

(b) That ametropias and heterophorias are primarily ocular manifestations of basic disorders inherited, acquired, or both.

(c) That high or low retinoscope findings, low ductions, low recoveries, etc., are also indications of basic disorders.

(d) That ocular manifestations should be modified as much as possible before supportive lenses for constant wear are prescribed.

(e) That lenses and prisms as commonly prescribed for constant wear do not correct the condition but merely neutralize the manifestation and act as support.

(f) That in all reconditioning it is essential to change the properties of light as well as the pathway.

There are many cases of ocular discomfort showing a fairly well balanced ocular pattern,

and many who present erratic ocular findings but have no difficulty. There are also a great number showing refractive errors who complain of discomfort and are relieved by the wearing of lenses which neutralize the manifestation. However, the mere obliteration of the symptoms is not satisfactory proof that the condition has been corrected.

Even if ametropias and heterophorias were anatomical and structural shortcomings, a lens or prism would not correct the condition but merely neutralize the effects of such defects and anomalies. Furthermore, if ocular tests revealed "ocular conditions" per se, the optometric profession would have reached the acme of perfection with the advent of precision instruments, such as the ophthalmometer and others with which exacting ocular tests are made. It seems to have been the hope and dream of many refractionists that someone would some day invent an instrument with which the exact shape of the eye could be determined, and the exact length of extrinsic muscles measured.

Today it is well known that such an instrument would have little or no value, because the compensatory power of the body is so tremendous that slight anatomical and structural variations in a pair of eyes, free from other interferences, are relatively insignificant.

It is interesting to note the inconsistencies that have existed in optometric principles for many years upon which many techniques have been evolved. Perhaps the most outstanding of all is the prescribing of "the

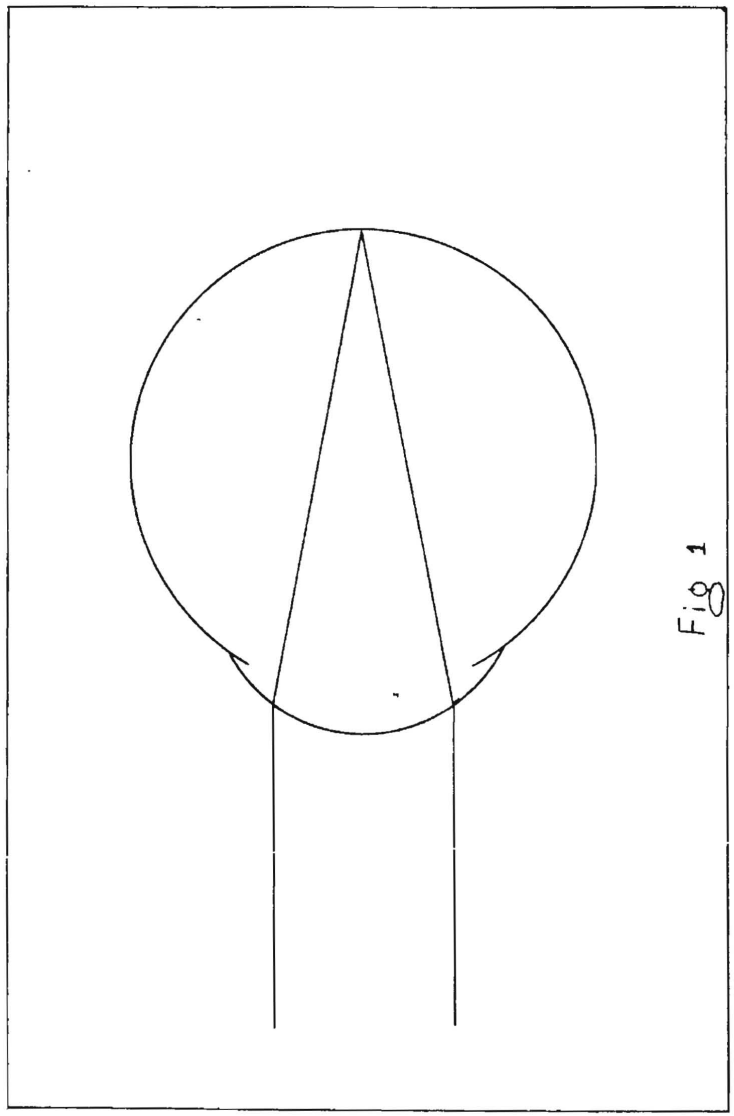

Fig 1

least minus and the most plus." Only casual observation is necessary to determine that if "the least minus" were correct in prescribing for myopia then "the most plus" for hyperopia would have to be wrong, because they are opposite manifestations. If it is correct to reduce myopia, esophoria and exophoria as much as possible, and prescribe only that amount of minus lens, base in or base out prism power actually needed for clear and single vision, why is it not also correct to reduce hyperopia? Of course, if we assume that hyperopia is an anatomical defect, and that the ciliary muscles are compelled to contract, allowing for an increase in curvature of the crystalline lens to compensate for the hyperopia, there would be some virtue in prescribing all the plus lens power the patient would accept without blur, but there is sufficient evidence to disprove that assumption.

A simple test is to observe with the retinoscope the eyes of a hyperope who has normal vision without lenses. Place a working lens in front of one eye and observe the reflex with the retinoscope while the patient is reading the twenty foot letters on the distance chart with the other eye. It may be stated that under such an arrangement, the eyes would not be working together, but it is not likely that the ciliary muscles would contract in the eye employed for seeing and not in the one being observed through the retinoscope. If then, there is approximately equal ciliary activity in both eyes, even though one of them is not actively engaged in seeing at that time, and it were true that the ciliaries together with crystalline lens

are used to compensate for the hyperopia, a relatively neutral reflex should be found in the eye under observation through the retinoscope. On the contrary, it is found that nearly the same amount of "with motion" represented by the total amount of hyperopia is still present.

Another test would be that of directing attention to a distance test object, having the same size letter on two different backgrounds; one of them a monochromatic red near the extreme red end of the spectrum, and the other one a monochromatic blue. A hyperope who might have normal vision under a polychromatic or composite light source, would have difficulty reading the normal letter on the monochromatic red, but would have no trouble reading that same size letter on the monochromatic blue.

This brings us to the chromatic interval of the eye which accounts, at least in part, for this phenomenon. The generally accepted theory upon which nearly all optometric techniques have been based, is that a composite light source produces a single focal plane in the eye as shown in Figure 1 on preceding page, when in actuality, the eye is not achromatic, and the polychromatic light source is broken up into its various component parts, producing different focal planes. Experiments tend to show that under a composite light source, we are able to recognize form no matter which one of the several focal planes may be impinged on the macula. Figure 2 on preceding page shows this relative arrangement. It is only relative because, actually, the distance from the violet to the

red focal planes in the average eye is only about $\frac{1}{2}$ mm. This is calculated on the basis that the average individual has a chromatic interval of about $1\frac{1}{2}$ diopters at the macula, and that the difference of 1 mm. in the anterior-posterior length of the eye makes a difference of 3 diopters. Other illustrations on succeeding pages are to be interpreted on the same basis.

In view of these facts, it is quite easy to explain and also to demonstrate that it is the shift in the chromatic interval which enables the average young hyperope of a moderate degree, to have normal vision without supportive lenses, and that the ciliaries together with the crystalline lens, play a very small part, if any, in the distance vision. Furthermore, that part of the accommodative or focus mechanism does not necessarily make up the entire adjustment for near vision.

The increase in curvature of the lens at 16" may therefore range from zero to $2\frac{1}{2}$ diopters, depending on the span of the chromatic interval in the individual.

Occasionally we hear of someone 80 or 90 years of age who reads relatively small print without supportive lenses, who also has clear vision at distance, and does not have extremely small pupils. While such cases are relatively rare, we know that almost every presbyope is able to read small print with considerably less plus addition than our accepted standards call for, i.e., the amount that may be required according to the fused cross cylinder test or the dynamic

retinoscope finding. If a plus lens actually relieves ciliary stress, it is strange that so many individuals are still uncomfortable, some of them even more so, with the indicated plus lenses in place. On the other hand, we wonder why a small amount of lens power, either plus or minus, sometimes relieves discomfort. If plus lenses are for the sole purpose of relieving the strain of the delicate ciliary muscles, why should a youngster 10 or 12 years of age, having an amplitude of 12 to 14 diopters of accommodation, ever require a plus .50 or plus .75 sphere, when many others walk around and even read incessantly, showing the need of 1 or even 2 diopters of plus sphere, but are not aware of any ocular disturbance?

Unfortunately, many of our presently accepted optometric principles were established in the optical laboratory, with the result that some of them are false because the purely optical phase is only a part of the visual act, and the compensatory powers of the body have been almost completely ignored. It was believed that the optometrist's realm of activity was mainly a matter of measuring optical defects and supplying supportive lenses to neutralize the effects of such anatomical malformations. If that were correct, our ability to relieve ocular discomfort should have increased in proportion to the development of precision instruments, and refinements of the various tests. Instead, there are more uncomfortable eyes today than ever before. Many pages could be written elaborating on the last statement, but it is sufficient to state that it is high time for optometry to begin moving in a new direction.

Another phase which presents interesting material for comparative study is the subject of anisometropia. There are literally millions of individuals not wearing glasses who have no visual difficulty, no ocular discomfort, and are very efficient, in spite of the fact that they show considerable hyperopia and astigmatism, and in addition to that, a considerable difference in the refraction between the two eyes. From that point of view it appears that the importance of equalizing the refraction in cases of anisometropia has been stressed entirely too much.

A similar misapprehension seems to exist with regard to heterophorias. It will be shown later in this work that such manifestations are primarily an expression of the basic psycho-physiological setup of the individual. An esophoria of the same degree in a number of different patients may have a different meaning in each one.

In the light of present day knowledge, a "field of refraction," as a primary factor does not exist. The eyes are part of the body, subject to the same laws that govern other parts. They are nourished by the same blood stream, and are easily affected by circulatory, as well as other psycho-physiological disturbances. In many instances of general disorders, the eyes are even more readily affected because of the increased sensitivity due to the greater number of nerve endings and intricate vascular system. Consequently, the refractive setup must be considered as secondary to reconditioning in most cases.

Still another reason for a number of false principles in commonly accepted optometric techinques is the fact that only the changing of the course of light was considered. The eyes, being the only part of the body which respond to a change in the pathway of light may account for many wrong conclusions drawn by optometric investigators.

The fact that the eyes are the only organs which respond to a change in the directions of light does not mean that they do not respond to other types of stimuli. In fact, in some cases the ocular responses to changes in composition of light is even greater than to alteration in the direction.

These principles may be applied by obtaining five pairs of colored lenses edged to fit the trial frame, and combining them with lenses and/or prisms as indicated. After the desired combination has been inserted in the trial frame, cover the sides with some opaque substance to exclude extraneous light, and direct the patient's attention to a trans-illuminated target at sixteen inches. That being the distance at which the near ductions are taken, it is the more desirable because, the amount of prisms base in or out is dependant on the recovery point, and if the target for training is placed at the same distance, the necessary prism power is indicated by the recovery point.

When any of the blue-indigo-violet frequencies are being used it is well to instruct the patient to close the eyes at certain intervals, but if one of the red-orange-yellow bands is applied, it is better to turn the

light on and off or employ an automatic flasher in the usual manner.

The differential responses to changes in the pathway of light, accomplished by minus lenses to spread the light and with plus lenses to converge it are well-known. Also that of changing the direction with prisms base in, out, up or down. But the responses to selected portions of the spectrum is not so well-known because it has only recently been introduced into optometric procedures. However, this method of utilizing the visible portion of the light spectrum for the purpose of altering bodily functions has been in use for many years by general practitioners, and the various effects produced by that method are well-established. It is only necessary to differentiate between general and specialized application.

In optometry, we are mainly interested in altering ocular function. If, by doing that, beneficial results are also obtained in other parts of the body, it must be considered similar to the general physical benefits which very often follow the application of lenses for constant wear.

Since the various portions of the spectrum become manifest to the sense of sight as color, we designate them by number, employing a system which has been in use for many years by general practitioners, advanced by Dr. Carl Loeb. In that system a filter known as #1, is flame red. Spinach green is #2. Medium amber #3. Medium blue #4, and blue-violet is #5.

These are the five basic filters which may be combined to form other bands which elicit specific responses. When two of the basic filters are combined, such as #1 and #5, the frequency is then known as #15, #1 and #3, as #13, #2 and #3, as #23, etc. In this particular system, the smaller number is placed in front, as shown in the above examples. There are three combinations which are not used. They are (#1 and #2), (#2 and #5), and (#3 and #4).

For optometric purposes, we use the various band in harmony with lenses and prisms to alter ocular function.

Whenever minus lenses are indicated for stimulating focus, frequency #1 is also called for. When prisms base out are required to increase convergence, frequency #3 is the most desirable. Should plus lenses be indicated to inhibit focus, the #4 band is most suitable. In case there is a need for prisms base in, the #5 band is similar in action. Variations from this relationship are considered in another chapter. Fundamentally, there are only two types of responses....contraction and expansion. Any band on the blue-indigo-violet end of the spectrum usually induces expansion, whereas, the red-yellow-orange frequencies tend to cause contraction. The main difference between lenses and prisms to change the pathway of light, and filters to change the composition of light is that the effect of the former is more localized and the responses of the latter are more general. However, when the two are combined in harmony with each other as stated previously, both phases

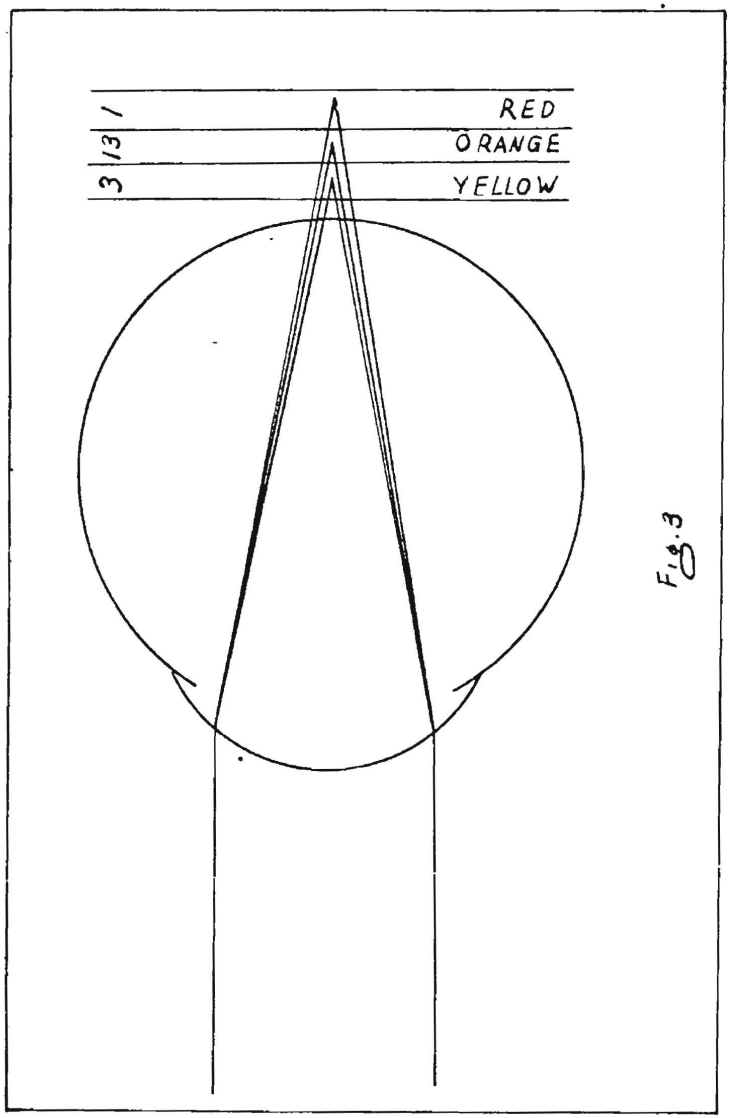

Fig. 3

seem to be more suitable for optometric purposes. In other words, the changing of the pathway of light alone, as commonly practiced in optometry is incomplete, and to use the various portions of the spectrum without combining them with various lenses and prisms as indicated by the examination is also incomplete.

This is readily understood when we consider the chromatic interval of the eye as shown in Figure 2 on preceding page. It must be kept in mind that this drawing is merely relative and that the distance from #1 to the #5 band in the eye is only about $\frac{1}{2}$ mm. All investigators seem to agree that the chromatic interval in the average eye is about $1\frac{1}{2}$ diopters. We may assume then that there is a certain plane at the macula on which the #2 band is impinged under the most desirable visual conditions. If we now place a minus lens in front of such an eye, the #2 band would be moved further back which would interfere with the habitual focus, and to re-establish that visual condition, it is necessary for the crystalline lens to increase its curvature, neutralizing the effect of the minus lens in front of the eye. Therefore, it has been stated that a minus lens in front of such an eye would stimulate accommodation, which is correct because that can be demonstrated.

To show the similarity between the effect of the minus lens and that of the #1 band, we may refer to Figure 3 on preceding page, showing that when a red filter has been placed before the eye, the green-blue-indigo-violet portion being absent, leaves the eye

without any portion of the spectrum focused on the macula, interfering with clear vision. In order to bring that portion of the spectrum forward, an increase in the curvature of the crystalline lens is also necessary to counteract the effect of the red filter. Accordingly, it will be readily understood that when we combine the minus lens and the red filter that the response should be decidedly greater than if either one of them is used alone.

If this is true then the opposite of combining a plus lens with a blue filter should elicit an opposite type of response. This has been demonstrated thousands of times and is well established beyond a shadow of doubt. These, however, are only generalities and therefore insufficient for practical purposes. If these simple basic facts are kept in mind, there should be no difficulty in comprehending what is to follow.

As stated previously, optometrists are all familiar with the differential responses obtained by various changes in the pathway of light, produced with lenses and prisms, and no space need be utilized in this work on that phase. But the differential responses elicited by the application of various portions of the spectrum requires further elaboration for intelligent application to enable the practitioner to apply them in practice as intended in this volume.

If the reader will bear in mind that the only difference between the red and the violet end of the spectrum is wave-length and frequency, we may use various analogies to explain why,

not only the ocular mechanism but all bodily functions respond differentially to the various frequencies. The red portion contains the longer wave-lengths and lower frequencies and the waves become shorter while the frequency increases toward the violet end of the spectrum. In that respect, there is a decided similarity between color and sound, the difference is mainly a matter of speed, and the medium in which the waves travel.

We may even consider a more simple form of the wave action by referring to the common experience of producing a disturbance in water. For example, if we throw a large stone or other object into a pool of water, the circular waves emanating from that point would be large and in relation to the size of the object. On the other hand, a much smaller object would produce much smaller waves. If the first stone were to weigh about a pound and the second a relatively small pebble weighing less than an ounce, there would be a decided difference in both the wave length and frequency produced by the two stones.

To explain what is meant by wave length and frequency, we may state that wave length is the distance from the crest of one wave to the next. If we now place a stick in the water a short distance from the point where the stone submerged and count the waves as they pass the stick, we would find that, since both types of waves travel at approximately the same speed, many more of the smaller or shorter waves would pass in the same length of time. Consequently, the shorter the wave length, the higher the fre-

quency, because frequency means how many waves pass a certain point during a specified time.

If this same wave action is applied to air and the various waves in the air stimulate the auditory nerves, we find that the longer waves or lower frequencies produce what is known as a low tone. Whereas, the shorter waves or higher frequencies produce what we refer to as the higher sounds, notes, or pitch. In that way, we may think of the low tones in relation to the red end of the light spectrum, and the higher tones to that of the blue-indigo-violet portion.

As an example to explain the comparison

other fork would also be disturbed but it would require a sensitive instrument to detect it. So we may state that, the waves produced by the strings of the piano affect both forks, but the former is more vehemently disturbed.

If we tighten the strings while they are still in motion, the rate of vibration will increase in proportion to the augmented tension. If this tension is increased to the point where the rate of vibration corresponds more nearly to the second fork, the response of the first one would decrease while that of the second increases. Finally, the latter will become audible and the first one is no longer heard. There is a certain range be-

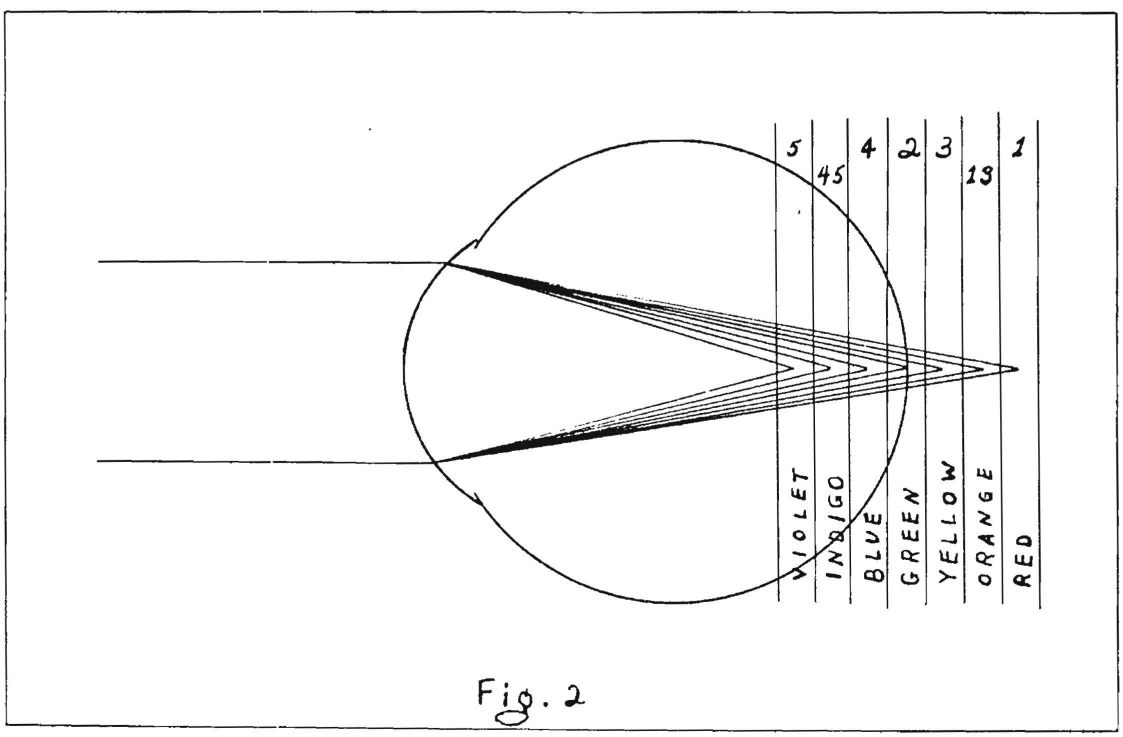

Fig. 2

ulant, meaning that the nerves of sensation respond more readily to this portion of light than other types of tissue. By the same token, the #4 band is referred to as a sensory depressant, the #3 frequency as a motor stimulant, and #5 as a motor depressant. Although such designation is inadequate, the reader may supply his own elaboration from the above explanation relative to the comparison between sound and color. Furthermore, that phase of the application of selected frequencies comes to us from the general practitioner and applies mainly to the general psycho-physiological responses. Since the eyes are part of the body and these selected frequencies elicit general as well as localized ocular responses, it is necessary that optometrists become familiar with those general effects in order to broaden their knowledge and understanding of localized ocular responses as they are associated with general disorders. To obtain this information, I recommend the book "A Course in Specific Light Therapy" by Dr. Carl Loeb. Any reference made in this volume relative to general responses in supportive functions to the ocular mechanism is based on my understanding of that subject on that basis.

My first experience in combining a selected portion of the spectrum simultaneously with lenses and prisms changing the pathway of light, was in a case commonly referred to as convergence insufficiency. The patient was a nurse, female, aged 28, who came to me complaining that she had not been able to read more than a few minutes at a time for nearly ten years. Aside from being uncomfortable, as soon as she began to read, the print

would double in a few minutes. As she explained, being a nurse, the services of several ophthamologists had been at her disposal during these ten years and everyone of them had been very anxious to help her. They had all tried to fit her with glasses, some of which made no difference whether she wore them or not, and others made her more uncomfortable than she was without. She had several pairs of glasses with her and asked if I cared to see them. They ranged from plus .25 cylinders at oblique axis to plus .37 spheres.

The static retinoscope finding was plus .25 cylinder 0.U.X 135 0. D. and 45 0.S. The phorias were 5 exophoria at distance and 18 exophoria at near. The base out duction at near or positive relative convergence was 8 break and -10 recovery, i.e., it required 10 base in before she could fuse the test object.

With a history of discomfort and inability to read for that long a period, I realized that the case might be difficult to handle and decided to try something different. My practice being a combination of general physical therapy and optometry, our equipment for producing a specific portions of the spectrum, which we had used only in our physical therapy department, consisted of a carbon arc lamp improvised to hold filters of various kinds in front of the light source, producing various bands which we numbered 1 to 5, as explained earlier in this chapter. This was according to my understanding of the information contained in lectures by Dr. Carl Loeb.

Since this arrangement had worked out unusually well in general physical therapy, I

decided to try it in ocular reconditioning through the proper lenses and prisms. The total amount of prisms base out, that the patient could tolerate at about 20 inches, were placed in the trial frame. This being the distance from her eyes to the light source, she was asked to gaze at the burning carbons, which could be seen through the filters, and try to keep the light source from doubling. The particular filters used were those numbered #2 and #3, or green and amber respectively. Within two or three minutes, the patient said, "Doctor, it feels as though a big load is being lifted from my head." A moment later, she stated that it was getting easier to look at all the time. At first, it had felt about the same as when she was trying to read; a sort of drawing sensation. But by this time, that was entirely gone. The patient, being very much elated over the change in the way her eyes felt, I decided to make the base out duction test at near, and to my surprise, it was ~~not~~ 16 break and 4 recovery. The break, having been raised from 8 to 16, and the recovery from 10 base in to 4 base out, which was an improvement of 14 prism diopters in the recovery. With such a remarkable change in so short a time, I became curious to know whether such a change would be only temporary or relatively permanent, so instructed the patient to return in one week unless she experienced any particular discomfort in the meantime.

A week later, she came in, all smiles, and stated that she had read several hours every day without discomfort or any sign of doubling. I immediately made the same test and was astonished to find that the test was now

22 break and 14 recovery. In view, of this experience, I told her that it was difficult to believe that she could have had all this ocular discomfort without some physical disturbances, and she answered that she did, but could not understand how that had any connection with her eyes, but stated that a decided change had taken place in other functions. She had had difficulty with constipation during all this time, beginning first with mild laxatives which had to be changed to more drastic cathartics, and later, even that did not seem to help, so during the past four years she had taken an enema almost every day. What puzzled her more than anything else was that since that one eye treatment, it had not been necessary to take an enema, indicating that there was a connection between her ocular difficulty and other disorders.

I have seen this patient a number of times during the past several years, and there has been no recurrence of her former difficulties. This experience led to further investigation which resulted in a special instrument being made to apply these principles in optometric procedure, and out of them grew the techniques described in succeeding chapters.

All techniques described in the following chapters are purposely based on a simple trial frame arrangement. This is to avoid discrimination against manufacturers on one hand or show favoritism on the other. It does not mean however, that I advocate such crude methods to recondition a pair of eyes, but feel that my responsibility ceases with the explanation of the basic principles involved, from a purely optometric standpoint.

If I were able to tell the reader how to attach a motor with belts and a driving mechanism on a buggy, in place of a horse, there would still be a decided difference between that and the modern automobile. In addition to that, there is a great difference in speed and riding comfort between the various automobiles on the market today, and the individual must decide which kind is best suited to his special need and within the limits of his budget.

The responsibility of properly calibrated filters of the proper material in accordance with the light source, optical set-up, and other features, rests with the manufacturers. Also refinements in technique and specific application of a certain modality must be supplied by the maker of such equipment.

The expected results as given in succeeding chapters however, are not based on the trial frame technique but were established with properly calibrated instrumentation to show the possibilities of the technique when properly applied.

CHAPTER TWO

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Routine examinstion according to the new principles showing that an ocular examination is a study of psycho-physiological r e - sponses and coordination.

Chapter Two

THE EXAMINATION

Since a number of good books on refraction contain the general outline of an examination such as the name, address, occupation, history, etc., no space need be utilized for that purpose here. Examination record sheets also designate a space for the above mentioned phases of an examination. We need but to outline the various tests and refer to those phases where a modification of procedure is desirable in conformity with succeeding analytical, palliative, and corrective procedures in this work. The following numerical method of designating the various tests will be adhered to in the remainder of this volume.

#1. Opthalomoscopic examination.

#2. Opthalomometer findings.

#3. The habitual phoria at distance.

#4. The habitual phoria at near.

#5. The static retinoscope test.

#6. The dynamic retinoscope test.

#7. The subjective test.

#8. The distance phoria with #7 in place.

All remaining tests are made with #7 finding in place for non-presbyopes. Special consideration of certain findings in case of pres-

byopia will be given later.

9. Distance prisms base out to blur.

#10. Distance prisms base out to break and recover.

#11. Distance prisms base in to break and recover.

#12. Distance vertical phoria.

#13. Induced phoria at near.

#14. The fused cross cylinder test.

#15. The near phoria through #14.

#16. The prisms base out test to blur out, break and recovery at near.

#17. Prisms base in test to blur out, break and recovery at near.

#18. Vertical phoria test at near.

#19. The accommodative amplitude.

#20. The minus lens blur out at near.

#21. The plus lens blur out at near.

Although most of these tests are described in a number of books on refraction and the average optometrist is well-versed in that phase, there is always a danger of making various tests so ultra-scientific that they become almost valueless from a practical standpoint. Unfortunately, there is often such a vast

difference between laboratory tests and office practice that the information gained in the laboratory is very misleading. For many years, ocular tests were interpreted primarily from the viewpoint of the physicist. The fallacy of such conclusions is well known, so we will merely concern ourselves at this time with those tests which require slight modifications.

Although every individual responds according to his particular psycho-physiological setup in relation to his environment, there is enough similarity in the human race to permit the establishment of certain fundamental principles upon which a method or technique may be based. All tests are primarily for the purpose of gaining information and should be made as nearly as possible under average lighting arrangements and in the simplest manner. It is not our intention nor is it necessary here to describe every test in detail, but merely to touch upon those phases which are more apt to produce different end results. After all, the important part is to establish a relative uniformity on a new basis.

At this point, it may be stated that it is undesirable to vary the general illumination during the examination because the neuro-physiological setup of some patients is very much affected by such changes in their environment. Furthermore, we do not recommend fine fixation objects for retinoscopy, either static or dynamic, because the purpose of all focus and convergence tests is to determine their habitual relationship to each other, and by introducing test objects which demand

minute fixation, the test will defeat its own purpose. Remember that we are not measuring "refractive errors" nor are we testing the strength of muscles as we formerly believed. All tests are made to obtain information relative to the patient's ocular difficulty and we interpret the findings on the premise that their deviations from the expected are the result of general disorders, past or present.

Consequently, the fewer variables we introduce during the examination, the more likely we are to arrive at the proper conclusions. Instead of trying to make an "accurate refraction," we are more interested in determining how the individual's ocular mechanism functions habitually.

After the first and second tests have been recorded, the distance habitual phoria or #3 is next in order. This is accomplished by producing vertical diplopia with the Stevens phorometer prisms and adjust them so that the lower image appears to the right, gradually bringing it into vertical alignment with the upper image. The amount of base out is recorded as esophoria, and if base in, as exophoria.

The #4 finding or habitual phoria at near is very often such that there is insufficient prism power in the Stevens phorometer, so it is better to use the rotary prisms for measuring the amount of the phoria, and merely use the Stevens phorometer prisms to produce vertical diplopia.

Test #5 or the static retinoscope finding is made by directing the patient's attention at

some distant object, having a plus lens in the phoropter of sufficient power to neutralize the difference between the patient's fixation point and the examiner's observation point. The most common are plus 2.00 spheres when the examiner wishes to work at a 20 inch distance and plus 1.50 spheres if he desires to work at a distance of 26 inches. While the patient's attention is directed to the distance object, the reflex from the pupil is observed through the retinoscope. As the beam of light from the instrument is moved across the pupil, in case of hyperopia, the movement of the reflex will be in the same direction as the beam of light. Then add plus spheres until the movement is in the opposite direction. Then reduce the plus sphere until it is neutral. In myopia, the movement of the reflex will be "against" and it is necessary to add minus spheres until it is also neutral. The amount of plus or minus sphere found in the instrument after the working lens has been removed, is recorded as the #5 finding. In case of astigmatism, after one meridian has been neutralized, add minus cylinders until the second meridian is also neutral.

The #6 or dynamic retinoscope test is made in a similar manner except that no "working lens" is needed because the fixation and observation points are now in the same plane. That is, the patient's attention is directed to some object in the same plane as the retinoscope. We repeat, it is undesirable to use fixation objects in retinoscopy which require effort, because the ocular pattern is primarily an expression of the basic pattern modified by local demands and such mod-

ifications will be more pronounced as local demands are increased by fine fixation objects. The purpose of retinoscopy on this basis is to study response and tonicity instead of refractive errors.

If we would make the various ocular tests on an individual several times in one day, we would very likely obtain a different set of findings each time. If, in addition to that, we would vary our technique, the variation in findings would be still greater. However, if we make the tests on the uniform basis mentioned earlier, we would be more apt to obtain an average set of finds of that individual's ocular pattern.

The taking of blood pressure is of a similar nature. It is the relationship of the systolic and diastolic pressures and the pulse rate which is important....not so much the amount, except in relatively extreme cases. When a retinoscope finding is made under stress, it is similar to taking blood pressure while the patient is lifting a heavy weight. Whereas, if the patient's attention is directed to a specific distance rather than a fine fixation object, the psychologic phase tends to bring all functions into their habitual relationship. Due to the fact that we have all been in the habit of thinking in terms of mathematical accuracy, it may seem somewhat strange at first to adopt a seemingly careless method of retinoscopy. In the majority of cases, there is not much difference in the findings, regardless of the technique employed. With these factors in mind, we may safely proceed with retinoscopy on that basis and expect reliable and uniform

end results. We may state that the 200-foot letter is quite satisfactory for all tests except the blur out tests, and of course those used for visual acuity.

The #7 or subjective test has perhaps received more attention in all former books on refraction than any other phase of the examination. Yet, this test like any other, is only one bit of circumstantial evidence, and has very little meaning by itself. Any one test is only of value in relation to other finds. Since this test follows the dynamic retinoscope finding, the simplest way to make it is to reduce the plus spheres or increase the minus as the case may be, from the lens power that is in the instrument after completing test #6, until the patient can read the 40-foot letter or slightly better, and inquire at this point whether or not the astigmatic chart appears uniform.

Unless there happens to be a great difference between the distance and near astigmatism, the amount of cylinder in the instrument at the completion of the #6 test is usually adequate to produce satisfactory neutralization of the astigmatic error. If not, slight changes may be made at this time to equalize the appearance of the astigmatic chart. After that has been done, it is well to produce horizontal diplopia and inquire if the 2 charts are about equally blurred. If not, it is well to equalize them under this slight blur because it is easier for the patient to recognize slight differences under this arrangement than after clear vision has been obtained. If the charts appear about equally blurred, the vertical prisms used for pro-

ducing diplopia may be dispensed with and the patient will again have single vision. Then it is only necessary to reduce the plus sphere or increase the minus until the patient sees the 20-foot letter or a trifle better, if the individual's best vision is decidedly better than 20/20. Then reduce the plus or increase the minus another .25 to 1.00 diopter in plus according to the age of the patient which is approximately as follows:

Up to age 10, it is usually well to leave about one diopter of hyperopic manifestation.

10 - 20 .....about .75

20 - 40 .....about .50

From then on slightly less than $\frac{1}{2}$ diopter if that amount reduces the visual acuity.

In non-presbyopes, the remaining tests are made through the lens combination remaining in the instrument after these deductions have been made. In all presbyopes, the Donders add according to age should be added to the above lens combination for all near tests. Although Donders add was calculated at a distance of 13 inches and most of our tests are made at 16 inches, we may use the same amount because we deduct a slight amount from the distance, whereas Donders used the full amount of plus to neutralize the distance manifestation.

The add according to age is approximately as follows:

Age 45.....Add plus 1.00

Age 50.....Add plus 1.50

Age 55.....Add plus 1.87 to plus 2.00

Age 60.....Add plus 2.12 to plus 2.25

Age 65.....Add plus 2.50

Age 70 or older....Add plus 2.75

The #8 test is the new distance phoria and is made mainly to study the reflex stimulation or inhibition to the convergence phase through the focus.

The #9 test is made by directing the patient's attention to the smallest distance line of letter that can be read, and slowly introduce base out prisms until there is a noticeable blur or some sign which indicates that convergence is beginning to interfere with focus. If such interference is not noticed by the patient, that test is considered negative. Otherwise, the amount of base out prisms at which the interference occurs is recorded as that finding.

The #10 finding or distance base out duction, is a continuation of the #9 test by increasing the prisms base out until diplopia occurs. However, the patient's attention may be directed toward the 200-foot letter for this test. Then the prisms base out are gradually reduced until a single image is again present,

which is known as the recovery. The amount of prisms base out at the time of break and recovery is recorded as the #10 finding.

The #11 finding is made in a similar manner except that prisms base in are employed.

The #12 test is merely that of producing horizontal diplopia and bringing the two images in horizontal alignment with prisms base up or down.

The #13 is the new near phoria test, and in presbyopes, the Donders add according to age is supplied in addition to the lens combination already in the instrument.

The #14 finding is the fused cross cylinder test at 16 inches. Since there are still many optometrists who do not make this test in their routine examination, a simple way of making it is here given.

With the indicated lens power for near in place, direct the patient's attention to the cross cylinder chart and inquire if both vertical and horizontal sets of lines appear about equally black. If not, it is well to equalize them with the required cylinder. When this has been accomplished, add the cross cylinder with the plus axis at 180, or you may make up your own cross cylinder from the trial-case or the phoropter, by inserting a plus .50 sphere and a -1.00 cylinder axis 90, for each eye. Then inquire again of the patient which set of lines appears darker. If they are still equal, the #14 finding would be the same as #7 for a non-presbyope, and for a presbyope, the #7 combined with the Donders

add according to age. If the horizontal lines appear darker, add plus spheres 0. U. until they are about equally black. If the vertical lines appear darker, add minus sphere to equalize them. Then remove the cross cylinder and the remainder is recorded as the #14 test. It is well to have slightly subdued illumination for this test. That is, the special illumination used for the various near tests is too intense for this test, and ahould be reduced.

The #15 finding is the phoria with the #14 lens combination in place, and is mainly made for the purpose of studying the effect of this lens combination on the convergence.

The #16 finding consists of three steps. The patient's attention is directed to the smallest letter which can be read at 16 inches. Then prisms base out are introduced until this line is blurred out so it can no longer be read. If no blur occurs or if the letters double before they blur, that phase of the test is designated by an X. Otherwise, the amount of prism power at the time that the line of letters blurs out is recorded. Then more prisms base out are introduced until diplopia occurs and the amount of prism power recorded as the break, and then the prisms are reduced until there is again a single image, which constitutes the recovery.

The #17 finding is made in a similar manner, except that prisms base in are used.

#18 is the vertical phoria test at near.

#19 is the test to determine the amplitude of

accommodation, and is accomplished by directing the patient's attention to reading material consisting of the .62 M letters, and slowly moving it toward the eyes until a noticeable blur occurs. At this point the distance from the reading card to the patient's eyes is measured and translated into diopters.

The #20 finding is the minus lens blur out and is made at 16 inches with the patient's attention directed to the smallest letter which can be read and minus spheres added O. U. until that line is blurred out. The amount of minus lens power added is recorded as that finding.

The #21 finding is made in a similar manner except that plus lenses are added.

In addition to these tests, there are those of color field charting, the mapping of blind spots, transilluminations, and taking of blood pressure or any other test the examiner wishes to make as corroborative evidence, such as stereopsis, reading rate, etc. All of those except blood pressure are already well covered in other books and need no further elaboration here.

So many improvements have been made in the taking of blood pressure during recent years, and also decided changes in the interpretation of blood pressure findings have taken place, that the writer deems it advisable to present a few cardinal points relative to this phase. The older methods of taking blood pressure usually consisted of placing a stethoscope on the brachial arteries and determining the systolic and diastolic pressure by sound.

Those methods were unsatisfactory for several reasons. In cases where the pulse was weak and the individual happened to have a relatively fat arm, it was very difficult to determine the diastolic pressure. On the other hand, if the examiner happened to be somewhat hard of hearing, his findings were also unreliable. With some of the later types of instruments, however, no stethoscope is required and such types are recommended to optometrists because the findings are more reliable, especially since the average optometrist is not accustomed to the use of the stethoscope.

Most important, however, is the interpretation of the findings after they have been made. The systolic pressure by itself has very little meaning unless it is extremely high. It is the relationship between the systolic, diastolic pressures, and the pulse rate which is important. It may be stated that the following relationship is considered as relatively ideal for the average individual. The systolic pressure between 110 to 140, the diastolic pressure from 75 to 90, pulse rate 70 to 80.

The following chart on the interpretation of blood pressure is according to Dr. Loeb from Von Recklingshausen.

THE INTERPRETATION OF BLOOD-PRESSURE AND CUSTOMARY PATHOLOGY TO LOOK FOR AS EVIDENCED BY THE COMBINATION OF SYSTOLIC, DIASTOLIC, AND PULSE RATE

1. Suggests a poor myocardium; incipient dilatation.
2. Suggests an overworked heart; incipient hypertrophy.
3. Suggests aortic insufficiency. The diastolic is failing in its efforts to compensate for the increased cardiac effort.
4. Intracranial tension. Suggests vascular changes met with in arteriosclerosis, cardio-renal diseases, etc. Points to apoplexy.
5. Suggests a failing myocardium, a possible nephritis and other cardiovascular changes. Seen after apoplexy.
6. A reading often seen in neurasthenia, neurosis, etc.
7. Cardiac insufficiency. Suggests tuberculosis or other infection.
8. Suggests abnormal relation of the components of the blood as seen in anemias; cardiac weakness; possible tuberculosis. A reading seen in typhoid, septic endocarditis, etc.
9. Cardiovascular strain; incipient cardio-renal disease.
10. Hyperpiesia, a condition of arterial tension existing prior to cardiovascular changes; a reading often met with in neuritis, the climacteric period and in mental overwork, worries, etc.
11. Suggests that patient is extremely toxic; precedes cardiac failure.
12. Suggests thyroid intoxication. Endocrine dysfunction.
13. When long continued, it points to kidney dysfunction with or without albuminuria.
14. Nervous hypertension. Look for psychic causes.
15. When persistent, it points to failing heart.

SYSTOLIC PRESSURE

60-90	92-110	112-140	142-190	192-280		DIASTOLIC PRESSURE
			50-70-4 72-86-4 88-120-5	50-70-4 70-86-4 88-120-5	110-170	
		72-86-13 88-120-1	50-70-2 72-86-9 88-120-5	50-70-4 72-86-4 88-120-5	90-110	
	72-86-6 88-120-7	Normal	50-70-10 72-86-10 88-120-14	50-70-10 72-86-10 88-120-14	74-90	
	90-120-8	50-70-2	72-86-15 120-150-12	50-70-2	50-72	
11	50-70-11 92-120-8	60-80-3	15	15	10-50	

Courtesy of Actino Laboratories, Inc.

HOW TO USE THE BLOOD PRESSURE CHART

The upper row of figures represent the various groups of systolic pressure. The figures along the right side are the diastolic groups. The figures in the squares or rectangles denote the pulse rate and the interpretation. Example: The patient has a systolic pressure of 155, and the diastolic pressure is 95, with a pulse rate of 90. The systolic pressure is between 142 and 190, which is the second set of figures from the right in the upper horizontal row. Follow downward from that set of systolic figures to the square which is in horizontal alignment with the second set of diastolic figures from the top, which are 90-110, as the patient's diastolic pressure is 95, which comes between those figures. In that square are three sets of figures representing possible pulse rates, and numbers designating the various interpretations from 1 to 15 given above the chart. Since this patient's pulse rate is 95 it comes between 88 and 120 which is the lower set. At the end of this is number 5 which, as stated, suggests a failing myocardium, a possible nephritis and other cardiovascular changes. Seen after apoplexy. Aside from the "normal" square in the center, all vacant squares are considered as normal also. The number 11 in the lower left hand square and the number 15 in the two lower right hand squares denote interpretations, number 11 and number 15.

On this basis, the taking of blood pressure is of great value to the optometrist as corroborative evidence and should be taken in nearly all cases past 40, and many younger individuals where definite symptoms of circulatory disturbances are suspected.

CHAPTER THREE

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Classification of Case Records

Thirty complete case records to explain method of classifying cases. Each case represents a specific ocular syndrome, used for reference in other chapter.

Chapter Three

CLASSIFICATION OF CASE RECORDS

Due to new discoveries in optometry during the last decade, the basic principles in Chapter One have been established, and in harmony with those principles, the following method of classifying case records has been evolved.

In this work we consider hyperopia, myopia, esophoria, and exophoria as the basic ocular manifestation of general phycho-physiologic disturbances. The basic classifications which are designated by capital letters from A to I are as follows:

Classification A: Emmetropia with orthophoria.
Classification B: Emmetropia with esophoria.
Classification C: Emmetropia with exophoria.
Classification D: Hyperopia with orthophoria.
Classification E: Hyperopia with esophoria.
Classification F: Hyperopia with exophoria.
Classification G: Myopia with orthophoria.
Classification H: Myopia with esophoria.
Classification I: Myopia with exophoria.

In addition to that, if the patient complains of discomfort, the small letter 'a' is added to the capital letter, designating the basic classification. If the vision is below normal in either one or both eyes, the small letter 'b' is added. For example, Classification D with discomfort would be designated as D-a. The same classification with discomfort and lowered visual acuity is designated as D-a-b. If there is not discomfort but lowered visual acuity in one or both eyes, the designation is D-b.

In addition to that, various complications may be added. This makes it possible to describe a case record without giving the findings and is intended mainly for more convenient intercommunication between practitioners. Although there are many complications, they would rarely exceed five or six in any one case. Under complications, we may list suppression, suspension, scotoma, abnormal color fields, diminished visual fields, vertical imbalances, cyclophoria, various low findings, low stereopsis, opacities, etc. Also various physical conditions which are known to the patient, such as diabetes, nephritis, anemia, etc., may be listed.

For example: Mrs. S. L. D. Age 28. Classification F-a-b with the following complications....#6, #13, and #14 findings high; #10, #16, and #20 low; which would mean that the case is one with hyperopia and exophoria having discomfort and below normal vision. The high and low findings mentioned as complications are decidedly high or low in relation to other findings of the case.

In the succeeding chapter, it will be shown that this classification with the complications constitute a definite syndrome from the standpoint of basic disorders, and yet it is not necessary to give all of the findings. This example is given at this point merely to show the soundness and simplicity of the method. Many more examples will follow in succeeding pages. The only findings required for the basic classifications from A to I inclusive are #5, #7, #8 and #13. #5 is needed only in cases where #7 cannot be made satisfactorily, i.e., when either the vision is too low or the subjective test is unreliable for some other reason.

CLASSIFICATION A.
7. plus .25 to plus 1.00.
8. Ortho.
#13. 6 Exo.

CLASSIFICATION B.
7. plus .25 to plus 1.00.
8. 1 Eso. or more.
#13. 5 Exo. or less.

CLASSIFICATION C.
7. plus .25 to plus 1.00.
8. 1 Exo. or more.
#13. 7 Exo. or more.

CLASSIFICATION D.
7. plus .50 to plus 1.25 or more.
8. Ortho.
#13. 6 Exo.

CLASSIFICATION E.
7. plus .50 to plus 1.25 or more.
8. 1 Eso. or more.
#13. 5 Exo. or less.

CLASSIFICATION F.
7. plus .50 to plus 1.25 or more.
8. 1 Exo. or more.
#13. 7 Exo. or more.

CLASSIFICATION G.
7. plano or minus.
8. Ortho.
#13. 6 Exo.

CLASSIFICATION H.
7. plano or minus.
8. 1 Eso. or more.
#13. 5 Exo. or less.

CLASSIFICATION I.
7. plano or minus.
8. 1 Exo. or more.
#13. 7 Exo. or more.

EXAMPLES

CASE #1. CLASSIFICATION A.

This is the ideal case record to be used as the standard by which abnormal findings are to be determined.

1. Neg.
2. Neg.
3. Ortho.
4. 6 Exo.
5. plus .25 to plus 1.00.
6. plus 1.00 to plus 1.75.
7. plus .25 to plus 1.00.
8. Ortho.
9. 7 or more.
10. 20/10.
11. 9/5.
12. Neg.
13. 6 Exo.
14. plus 1.00 to plus 1.75.
15. 6 to 8 Exo.
16. 14/21/15.
17. 14/22/18.
18. Neg.
19. According to Donders.
20. -2.00 to -2.50.
21. plus 2.00 to plus 2.50.

Although this classification is regarded as the ideal case record, there are certain modifications which must be kept in mind when a record is classified. In general, there are at least three age levels which must be given some consideration.

The findings as given in this example may be regarded as quite satisfactory in the major-

ity of healthy individuals ranging in age from about 15 years to 35 years. Even in that range there may be slight modifications according to environment and inherent characteristics of the individual.

In young children, the blur-out tests are very often somewhat higher. After the age of 30, those tests may be somewhat lower and still not considered as abnormal. In any event, we do not expect to make the eyes of every person conform to this particular standard. They are mainly intended to serve as a guide for interpretation in relation to that particular individual. The history and subjective symptoms of the patient are then used as corroborative evidence. If that coincides with our findings, we are reasonably safe to assume that we are working in the right direction.

After the examination has been made, the first point to consider is whether the manifestation is that of emmetropia, hyperopia, or myopia. Next, is it orthophoria, esophoria, or exophoria? This determines the basic classification.

Assuming that it is hyperopia with esophoria, the basic classification would be E. That happens to be Case #13. However, the subjective symptoms may be that of asthenopia, headache, photophobia, or some other form of discomfort, which the patient may attribute to his eyes as the cause. In that case, the small letter "a" would be added to the basic classification, and we find that this example is Case #14.

Then turn to Chapter Four under Case #14 where you will find a fairly comprehensive explanation of the various syndromes under that classification according to age, sex, and environment. In this way, any practitioner may have the benefit of years of experience and research from a practical standpoint.

CASE #2. Male, Age 62. CLASSIFICATION A-b

Complains of eyes watering and poor vision.
V.A.20/60 O.U. Complications: All ductions low.
#10 and #16 recoveries low.
Vertical imbalance at distance and near.
Lenticular opacities.

FINDINGS

1. Neg.
2. Neg.
3. Ortho.
4. 6 Exo.
5. plus .25.
6. plus 2.25.
7. plus .25
8. Ortho.
9. 6
10. 12/6
11. 5/2
12. 1 R. H.
13. 6 Exo.
14. plus 2.25
15. 8 Exo.
16. 8/14/2
17. 10/18/12
18. 2 R.H.
19. 1 D
20. -.75
21. plus .75

ANALYSIS

1. #23 X 2
2. Neg.
3. Neg.
4. Neg.
5. Pox X IR X IN
6. #23 X 2
7. Neg.
8. Neg.

This shows very clearly that the basic classification may come under the same category as Case #1, but because of the lowered visual acuity, the small letter "b" is added and that, together with the various complications, complete the syndroms of the patient's ocular difficulties from which he seeks relief.

CLASS #3. Female, Age 18. CLASSIFICATION A-a-b

Complains of frontal headaches. V.A. 20/30 O.U.
Complications: None in ocular pattern.

FINDINGS

1. Neg.
2. Neg.
3. Ortho.
4. 6 Exo.
5. plus .25 to plus 1.00
6. plus 1.00 to plus 2.00
7. plus .25 to plus 1.00
8. Ortho.
9. 7 or more
10. 20/10
11. 9/5
12. Neg.
13. 6 Exo.
14. plus 1.00 to plus 2.00
15. 6 to 8 Exo.
16. 14/21/15
17. 14/22/13
18. Neg.
19.
20. -2.50
21. plus 2.00

ANALYSIS

1. Neg.
2. Neg.
3. Neg.
4. Neg.
5. Neg.
6. Neg.
7. Neg.
8. #24

Here we have the same findings as in Case #1. But the subjective symptoms of the patient call for the small letter "a" to be added and the lowered visual acuity is indicated by the small letter "b." In such cases, the technique used to alleviate the symptoms and improve the vision is based entirely on the history and complaint. The interpretation of those symptoms, however, is based on the age, sex, and environment, and the general behavior.

CASE #4. Female, Age 7. CLASSIFICATION B.

Sees double at near.
Complications; high esophoria at near. #11. #17 and #21 low. #5, #11, #13 and #17 low. #19 low. #17 recovery low.

FINDINGS

1. Neg.
2. Neg
3. 3 Eso.
4. 10 Eso.
5. plus .50
6. plus 1.50
7. plus 1.00
8. 6 Eso.
9. 10
10. 22/12
11. 3/0
12. Neg.
13. 12 Eso.
14. plus 1.25
15. 14 Eso.
16. 16/24/18
17. 8/12/-2
18. Neg.
19. 8 D.
20. -3.00
21. plus 1.50

ANALYSIS

1. Neg.
2. B.I.
3. Neg.
4. Neg.
5. Pos. X 2N
6. #23 X 2
7. #5
8. Neg.

This is one of the many cases that I believe has been very much mis-understood in the past. Almost invariably a small amount of plus sphere was prescribed simply because the patient would accept it without blurred distant vision. However, on this basis, the case is regarded as an emmetrope with esophoria. No lenses for constant wear are needed and yet this child has considerable visual difficulties. The many reasons for this and other combinations of symptoms will be found in the next chapter under Case #4.

CASE #5. Male, Age 12. CLASSIFICATION B-a

Complains that his eyes smart and feel like crossing when he reads.
Complications: High esophoria at near, #11, #17 and #20 findings relatively low.
Base out recoveries low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	4 Eso,
3.	2 Eso.	14.	plus 1.75
4.	4 Eso.	15.	Ortho.
5.	plus .75	16.	18/24/10
6.	plus 1.75	17.	14/18/12
7.	plus .75	18.	Neg.
8.	2 Eso.	19.	12 D
9.	10	20.	-1.50
10.	26/6	21.	plus 3.00
11.	8/4		

ANALYSIS

1. #23 X 2
2. B.I.
3. #15
4. Neg.
5. Pos X 2R
6. Neg.
7. Neg.
8. #24

The basic classification for this case is the same as for Case #4, except that the small letter "a" is added. Although the Findings are much better in this case, nevertheless the patient has discomfort showing that the amount of deviation from the expected does not necessarily indicate the amount of dφs-comfort.

CASE # 6. Female, Age 52. CLASSIFICATION B-b

Complains of failing vision. V.A. O.D. 20/40 O.S. 20/100.
Complications: All ductions low; lenticular opacities. Vertical imbalance at distance and #11 and #17 recoveries low.

FINDINGS

1.	Neg.	12.	I. L. H.
2.	Neg.	13.	4 Exo.
3.	4 Eso.	14.	plus 1.75
4.	2 Exo.	15.	5 Exo.
5.	plus .25	16.	x/18/12
6.	plus 1.75	17.	x/12/4
7.	plus .25	18.	Neg.
8.	4 Eso.	19.	3 D
9.	X	20.	not taken
10.	16/8	21.	not taken
11.	6/2		

ANALYSIS

1. #23 X 2
2. B.I.
3. Neg.
4. Neg.
5. pos. X 2N
6. #23
7. Neg.
8. Neg.

This is also the same basic classification as #4 and #5, but the subdivision "b" together with the patient's age, present an entirely different set of causative factors.

CASE #7. Male, Age 58. CLASSIFICATION C.

Unable to read. Sees double at near.
Complications: High exophoria at near. #10 and #16 recoveries low.
Vertical imbalance at near. #20 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	20 Exo.
3.	3 Exo.	14.	plus 2.00
4.	16 Exo.	15.	20 Exo.
5.	plus .25	16.	8/14/-2
6.	plus 2.25	17.	22/26/20
7.	plus .25	18.	2 R. H.
8.	4 Exo.	19.	1 D
10.	12/4	20.	-.50
11.	12/8	21.	plus .75

ANALYSIS

1. Neg.
2. B.O.
3. #15
4. Neg.
5. Pos. X 2 R
6. #23
7. Neg.
8. Neg.

In this case, the focus setup and the age are about the same as in Case #6. But, being an exophore, brings it into a different classification, and as explained in Chapter Four, is the result of an entirely different background.

CASE #8. Female, Age 15. CLASSIFICATION C-a

Eyes ache when reading.
Complications: #10 and #16 recoveries low. #19 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	9 Exo.
3.	4 Exo.	14.	plus 1.25
4.	8 Exo.	15.	12 Exo.
5.	plus 1.00	16.	10/16/2
6.	plus 1.50	17.	16/24/20
7.	plus .75	18.	Neg.
8.	5 Exo.	19.	10 D
9.	8	20.	-3.00
10.	18/4	21.	plus 1.50
11.	14/10		

ANALYSIS

1. Neg.
2. B. O.
3. Neg.
4. Neg.
5. Pos X 2R
6. #23
7. Neg.
8. #24

The patient's subjective symptoms and age are the main points which distinguish this case from Case # 7.

CASE #9. Male, Age 28. CLASSIFICATION C-b

Complains that fine print blurs, and has a drawing sensation around the eyes when he reads. N.V.A., O.D. 20/15, O.S. 20/40. Complications: High exophoria at near; #10, #16, and #19 low. #12 and #18 positive.

FINDINGS

1.	Neg.	12.	1 R.H.
2.	Neg.	13.	10 Exo.
3.	2 Exo.	14.	plus 1.00
4.	10 Exo.	15.	14 Exo.
5.	plus .75	16.	10/14/8
6.	plus 1.50	17.	16/24/18
7.	plus .75	18.	2 R.H.
8.	2 Exo.	19.	6 D.
9.	6	20.	-3.00
10.	12/6	21.	plus 2.00
11.	10/6		

ANALYSIS

1. Neg.
2. B.O.
3. Neg.
4. Neg.
5. Neg.
6. #23 x 2
7. Neg.
8. Neg.

This is another type which, I believe, has been very much misunderstood in the past because almost every refractionist was determined to prescribe plus, and yet the patient rarely accepted it with comfort.

CASE #10. Female, Age 6. CLASSIFICATION D

Poor vision, N.V.A. 20/80 O.U.
Complications: Astigmatism, low #11 and #17. Low #20. Through #7 20/20 O.U.

FINDINGS

1.	Neg.	12.	Neg.
2.	-2.00 x 180	13.	7 Exo.
3.	Ortho.	14.	plus 4.50-2.00 x 180
4.	6 Exo.		
5.	plus 4.00 -2.00x180	15.	8 Exo.
6.	plus 5.00 " " "	16.	14/22/16
7.	plus 4.00 " " "	17.	10/18/14
8.	1 Exo.	18.	Neg.
9.	X	19.	13 D
10.	20/12	20.	-2.00
11.	8/4	21.	plus 2.00

ANALYSIS

1. Neg.
2. Neg.
3. Neg.
4. Neg.
5. Neg.
6. Neg.
7. #5
8. Neg.

This type is very easy to classify but great care must be exercised in handling them because they are very susceptible to focus inhibition. Many of these cases have been made slaves to strong plus lenses, but in the light of present-day knowledge and optometric procedures, it is very often possible at this age to make postural changes in the focus mechanism that not only make a reduction in the lens power possible, but greatly improves their general physical condition.

CASE #11. Male, Age 24. CLASSIFICATION D-a

Bookkeeper. Has frontal headaches nearly every day during the afternoon.
Complications: low #10 and #16 recoveries and low #20 finding.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	7 Exo.
3.	Ortho.	14.	plus 2.50
4.	5 Exo.	15.	8 Exo.
5.	plus 2.00	16.	16/26/10
6.	plus 3.00	17.	12/24/18
7.	plus 2.00	18.	Neg.
8.	1 Exo.	19.	8 D.
9.	8	20.	-2.00
10.	24/8	21.	plus 3.00
11.	18/6		

ANALYSIS

1. Neg.
2. Neg.
3. #15
4. Neg.
5. Pos. X 2R
6. Neg.
7. Neg.
8. #24

With the symptoms of discomfort added to the basic classification, cases of this kind are very often difficult to handle because the prescribing of plus may disturb the otherwise harmonious relationship in the findings. On this new basis, as explained in succeeding chapters, we not only obtain immediate comfort but are very often able to eliminate the need of lenses for constant wear.

CASE #12. Male, Age 56. CLASSIFICATION D-b

Thinks he needs new reading glasses.
Complications: All ductions, low. Vertical imbalance at distance and near. Lenticular opacities.

FINDINGS

1.	Neg.	12.	1 L. H.
2.	Neg.	13.	7 Exo.
3.	1 Exo.	14.	plus 3.00
4.	5 Exo.	15.	8 Exo.
5.	plus 1.00	16.	10/14/8
6.	plus 3.00	17.	12/18/14
7.	plus .75	18.	2 L. H.
8.	1 Exo.	19.	I. D.
9.	8	20.	-.75
10.	12/6	21.	plus .75
11.	6/3		

ANALYSIS

1. #23 x 2
2. Neg.
3. Neg.
4. Neg.
5. Neg.
6. #23 x 2
7. Neg.
8. Neg.

The reason for this patient's complaint is obvious. Yet, it is necessary to disappoint him because glasses are not the solution.

CASE #13. Female, Age 38. CLASSIFICATION E

Print doubles when reading more than 10 or 15 minutes.
Complications: High esophoria at near. #11, #17, and #21 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	14 Eso.
3.	2 Eso.	14.	plus 2.00
4.	8 Eso.	15.	12 Eso.
5.	plus 2.00	16.	X/30/20
6.	plus 3.00	17.	X/16/2
7.	plus 2.00	18.	Neg.
8.	Ortho.	19.	6 D.
9.	4	20.	-2.00
10.	28/14	21.	plus 1.00
11.	6/3		

ANALYSIS

1. Neg.
2. B.I.
3. Neg.
4. Neg.
5. Pos. X 1N
6. Neg.
7. #5
8. Neg.

This is another type where the changing of the pathway of light was incomplete, and these patients usually went the rounds and every refractionist made the same mistake by prescribing the total amount of plus mainly because of the esophoria, but the patient hardly ever accepted it with comfort. Modern methods quickly relieve the discomfort and the prescribing of lenses for constant wear becomes relatively simple.

CASE #14. Female, Age 22. CLASSIFICATION E-a

Student. Occipital headaches most of the time. Eyes burn during near work.
Complications: Astigmatism, #9, #16, and #20 findings low.

FINDINGS

1.	Neg.	12.	Neg.
2.	plus 1.00 x 90	13.	4 Eso.
3.	3 Eso.	14.	plus 1.75 plus 1.00 x 90
4.	5 Eso.	15.	2 Eso.
5.	plus 1.00 plus 1.00 x 90	16.	14/22/8
6.	plus 2.00 plus 1.00 x 90	17.	12/20/14
7.	plus 1.00 plus 1.00 x 90	18.	Neg.
8.	2 Eso.	19.	10 D.
9.	4	20.	-1.00
10.	20/12	21.	plus 2.50
11.	9/5		

ANALYSIS

1. #23
2. B.I.
3. #15
4. Neg.
5. Pos. X 1R
6. Neg.
7. Neg.
8. #24

In this type, the total amount of plus is almost always gratefully accepted by the patient but actually is detrimental to the system as a whole, as explained in the next chapter.

CASE #15. Male, Age 8. CLASSIFICATION E-b

Poor vision. V. A. through #7. O.D. 20/40 O.S. 20/60.
Complications: Astigmatism, all recoveries low. #19 low. #20 low. #5, #11, #13, and #17 low.

FINDINGS

1. Neg.
2. O.D. Neg. O.S. -1.00 X 45
3. 10 Eso.
4. 6 Eso.
5. plus 2.00 with 0.S. cyl.
6. plus 4.00 with 0.S. cyl.
7. plus 2.50 with 0.S. cyl.
8. 8 Eso.
9. X
10. 20/4
11. 8/2
12. Neg.
13. 4 Eso.
14. plus 4.50 with 0.S. cyl.
15. Ortho.
16. x/24/8
17. x/16/4
18. Neg.
19. 8 D.
20. -.50
21. plus 3.00

ANALYSIS

1. #23 x 2
2. B.I.
3. #15
4. Neg.
5. Pos. x 2N x 2R
6. #23 x 2
7. Neg.
8. Neg.

In this classification with the subdivision "b", it is always well to improve the vision as much as possible before any lenses or a change in lenses is prescribed, and then only the amount which will actually improve vision, unless the patient does not respond to the training in which case lenses must be supplied as a last resort.

CASE #16. Female, Age 8. CLASSIFICATION F

Complains of inability to see clearly N.V.A. 20/100.
Complications: High exophoria at near. #20 low.

FINDINGS

1. Neg.
2. Neg.
3. 2 Exo.
4. 8 Exo.
5. plus 4.00
6. plus 4.50
7. plus 4.00
8. 6 Exo.
9. 10
10. 22/12
11. 14/12
12. Neg.
13. 18 Exo.
14. plus 4.00
15. 18 Exo.
16. 10/16/12
17. 20/28/22
18. Neg.
19. 13 D.
20. -2.00
21. plus 2.50

ANALYSIS

1. Neg.
2. B.O.
3. #15
4. Neg.
5. Neg.
6. Neg.
7. Neg.
8. Neg.

Young patients in this classification usually respond quickly to this new type of training and hardly ever need lenses for constant wear unless the manifestation is very high. The danger of over-prescribing is not so great because they will hardly ever accept the total amount with comfort.

CASE #17. Female, Age 35. CLASSIFICATION F-a

Housewife. Eyes ache when sewing or reading. Complications: Constricted color fields, all ductions low, all recoveries low, #19 finding low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	12 Exo.
3.	4 Exo.	14.	plus 1.50
4.	10 Exo.	15.	14 Exo.
5.	plus 1.00	16.	8/14/2
6.	plus 1.50	17.	18/26/10
7.	plus 1.00	18.	Neg.
8.	5 Exo.	19.	4 D.
9.	5	20.	-2.00
10.	12/4	21.	plus 2.00
11.	8/3		

ANALYSIS

1. #23 x 2
2. B.O.
3. Neg.
4. Neg.
5. Pos. x 2R x 2N
6. #23
7. Neg.
8. Neg.

These are the kind who are almost always determined that they must have glasses but are hardly ever benefited by them. They very often go from one refractionist to another, believing that if they can only get the right kind of glasses, they will have no more trouble. But no one seems to be able to fit them properly. By these new methods of reconditioning, they are easily helped and it is not difficult to convince them that they do not need glasses. Fortunately, after they have been convinced that proper reconditioning was the solution to their visual difficulties, they will bring in many new patients to the optometrist who cares for them in that manner.

CASE #18. Male, Age 74. CLASSIFICATION F-a-b

Eyes ache and water nearly all the time. Failing vision.
Complications: #10 and #16 recoveries low. #20 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	20 Exo.
3.	8 Exo.	14.	plus 3.50
4.	18 Exo.	15.	24 Exo.
5.	plus 1.00	16.	X/8/-4
6.	plus 3.50	17.	X/28/24
7.	plus .75	18.	Neg.
8.	10 Exo.	19.	0.
9.	4	20.	0.
10.	12/4	21.	plus .50
11.	14/10		

ANALYSIS

1. Neg.
2. B.O.
3. #15
4. Neg.
5. Pos. X 2R
6. Neg.
7. Neg.
8. #24

In the past, we were practically helpless in cases like this because they had to have the plus addition in order to see at near, but could not accept them because of the increase in exophoria. Even by this new method, they are very difficult to handle because whatever is done to give relief from the symptoms of discomfort, we still further disorganize the visual reflex.

CASE #19. Female, Age 12. CLASSIFICATION G

Blurred distance vision.

FINDINGS

1.	Neg.	12.	Neg.
2.	-1.00 X 180 0.U.	13.	6 Exo.
3.	Ortho.	14.	-1.00 X 180 0.U.
4.	6 Exo.	15.	6 Exo.
5.	-.50 X 180 0.U.	16.	10/22/14
6.	plus .25 X 180 0.U.	17.	8/16/10
7.	-.50	18.	Neg.
8.	Ortho.	19.	12 D.
9.	10	20.	-2.00
10.	20/10	21.	plus 1.00
11.	8/4		

ANALYSIS

1. Neg.
2. Neg.
3. Neg.
4. Neg.
5. Neg.
6. Neg.
7. Neg.
8. Neg.

The new methods of procedure advanced in succeeding chapters of this volume, are perhaps of greatest benefit to this type of case at about this age. The majority of them are not difficult to cope with, and lenses for constant wear are hardly ever needed.

CASE #20. Male, Age 50. CLASSIFICATION G-a

Business executive. Eyes tire when reading, and feels bilious afterwards.
Complications: All recoveries low. Vertical imbalance at distance and near.

FINDINGS

1.	Neg.	12.	1 R.H.
2.	Neg.	13.	5 Exo.
3.	1 Exo.	14.	plus 1.00
4.	7 Exo.	15.	8 Exo.
5.	-.50	16.	X/18/4
6.	plus 1.00	17.	X/22/10
7.	-.50	18.	1 R.H.
8.	1 Eso.	19.	3 D.
9.	10	20	-1.00
10.	20/6	21.	plus 1.00
11.	10/3		

ANALYSIS

1. #23 X 2
2. Neg.
3. Neg.
4. Neg.
5. Pos. X 2R X 2N
6. #23 X 2
7. Neg.
8. Neg.

At this age, we no longer expect to reduce the myopic manifestation and to obtain comfort for the patient is a relatively simple process by these new methods.

CASE #21. Female, Age 46. CLASSIFICATION G-b

Noticed vision failing during past year. Has never worn glasses. N. V. A. 20/60 O.U.
Complications: All ductions low. Vertical imbalance at distance. Lenticular opacities. #5, #11, #13 and #17 low.

FINDINGS

1.	Cloudy media.	12.	1 R. H.
2.	Neg.	13.	5 Exo.
3.	2 Eso.	14.	plus 1.00
4.	4 Exo.	15.	7 Exo.
5.	-.25	16.	12/16/10
6.	plus 1.25	17.	10/14/8
7.	Plano	18.	Neg.
8.	2 Eso.	19.	3 D.
9.	8	20.	-1.00
10.	10/5	21.	plus 1.00
11.	4/2		

ANALYSIS

1. #23 X 2
2. Neg.
3. Neg.
4. Neg.
5. Neg.
6. #23
7. Neg.
8. Neg.

Many in this group respond very well to this new type of training. Their vision usually improves to where it is quite satisfactory to the patient and the condition in many of them is arrested.

CASE #22. Female, Age 16. CLASSIFICATION H

Student. Unable to see distant objects clearly. Has had glasses but they caused eyes to ache when reading.
Complications: #10 and #16 recoveries low. #20 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	6 Eso.
3.	2 Eso.	14.	Plano
4.	4 Eso.	15.	4 Eso.
5.	-1.50	16.	X/24/4
6.	Plano	17.	14/20/16
7.	-1.50	18.	Neg.
8.	4 Eso.	19.	12 D.
9.	8	20.	-1.00
10.	22/8	21.	plus 2.00
11.	12/8		

ANALYSIS

1. Neg.
2. B. I.
3. #15
4. Neg.
5. Pos. X 2R
6. Neg.
7. Neg.
8. Neg.

Myopes in this group have also been very much misunderstood in the past because it is generally believed that the myopia is due to excessive near work. Very likely the near work is a contributing factor and must be reckoned with, but experience on this new basis points to other factors as being more important.

CASE #23. Male, Age 9. CLASSIFICATION H-a

Unable to read material on blackboard at school. Eyes ache when reading.
Complications: #10, and #16 recoveries low. All ductions low. #19 and #20 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	Ortho.
3.	3 Eso.	14.	Plano
4.	2 Exo.	15.	2 Exo.
5.	-.75	16.	10/30/6
6.	plus .25	17.	8/16/10
7.	-.75	18.	Neg.
8.	4 Eso.	19.	6 D.
9.	9	20.	-.25
10.	26/8	21.	plus 1.50
11.	6/4		

ANALYSIS

1. #23 X 2
2. B. I.
3. #15
4. Neg.
5. Pos. X 2R
6. #23
7. Neg.
8. #24

It is relatively easy to arrest the progress of myopic tendencies in this group, but more difficult to eliminate the manifestation than those with a syndrome similar to Case #22.

CASE #24. Female, Age 24. CLASSIFICATION H-b

Poor vision at all distances. Wearing -1.00 spheres O.U. V. A. 20/60. N.V.A. 20/80 O.U.
Complications: All ductions low. #19 low.

FINDINGS

1.	Retinitis pigmentosa	12.	Neg.
		13.	Ortho.
2.	Neg.	14.	-.50
3.	5 Eso.	15.	2 Eso.
4.	Ortho.	16.	X/10/6
5.	-1.50	17.	X/12/8
6.	Plano	18.	Neg.
7.	-1.50	19.	4 D.
8.	5 Eso.	20.	-1.50
9.	X	21.	plus 1.50
10.	12/6		
11.	8/4		

ANALYSIS

1. #23 X 2
2. B. I.
3. Neg.
4. B. O.
5. Neg.
6. #23
7. #5
8. Neg.

Because of the pathologic involvement, it is not a case for an optometrist and should be referred to someone trained to care for this condition, if it is still active.

CASE #25. Female, Age 6. CLASSIFICATION I

Poor distance vision.
Complications: None.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	8 Exo.
3.	4 Exo.	14.	-1.25
4.	10 Exo.	15.	9 Exo.
5.	-2.00	16.	16/22/14
6.	-1.00	17.	14/24/20
7.	-2.00	18.	Neg.
8.	2 Exo.	19.	13 D.
9.	10	20.	-3.00
10.	24/12	21.	plus 2.50
11.	12/8		

ANALYSIS

1. Neg.
2. B. 0
3. Neg.
4. Neg.
5. Neg.
6. Neg.
7. Neg.
8. Neg.

The greatest care must be exercised in cases of this kind because the patient readily accepts the full amount of minus with comfort but the manifestation rapidly increases if the total amount is prescribed. Special consideration is given to this group in Chapter Six under Corrective Procedures.

CASE #26. Male, Age 14. CLASSIFICATION I-a

Student. Eyes burn most of the time, and sees double at times when reading.
Complications: Base out ductions low. All recoveries low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	14 Exo.
3.	5 Exo.	14.	-1.50
4.	18 Exo.	15.	16 Exo.
5.	-2.00	16.	8/10/-4
6.	-1.25	17.	14/24/10
7.	-2.00	18.	Neg.
8.	3 Exo.	19.	12 D.
9.	6	20.	-3.00
10.	10/5	21.	plus 2.00
11.	12/4		

ANALYSIS

1. #23 X 2
2. B. 0.
3. Neg.
4. Neg.
5. Pos. X 2R X 2N
6. Neg.
7. Neg.
8. #24

The discomfort in cases of this kind has been difficult to cope with in the past, but are easily made comfortable on this new basis which is described in Chapter Five, and the technique for the reduction of the manifestation in Chapter Six.

CASE #27. Male, Age 48. CLASSIFICATION I-b

Complains of vision failing during past six months.
Complications: All recoveries low. Lenticular opacities. N.V.A. 20/40 0.U.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	10 Exo.
3.	2 Exo.	14.	plus 1.25
4.	8 Exo.	15.	10 Exo.
5.	-.25	16.	X/12/-2
6.	plus 1.50	17.	X/22/8
7.	Plano	18.	Neg.
8.	2 Exo.	19.	3 D.
9.	5	20.	-.50
10.	16/4	21.	plus .50
11.	10/3		

ANALYSIS

1. #23 X 2
2. B. O.
3. Neg.
4. Neg.
5. Pos. X 2R X 2N
6. Neg.
7. Neg.
8. Neg.

Very often the vision is improved enough to satisfy the patient in cases of this kind, but if that is not possible, there is nothing further we can do as optometrists.

CASE #28. Female, Age 11. CLASSIFICATION E-H

Complains that she does not see clearly at distance with the left eye. N.V.A.-O.D. 20/15, O.S. 20/40, through #7, 20/15 O.U.
Complications: All ductions low; #10 and #16 recoveries, and #20 low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	2 Exo.
3.	3 Eso.	14.	O.D. plus 1.75
4.	Ortho.		O.S. -.25
5.	O.D. plus 1.00	15.	3 Exo.
	O.S. -.50	16.	X/18/4
6.	O.D. plus 2.00	17.	X/12/8
	O.S. plus .50	18.	Neg.
7.	O.D. plus 1.00	19.	12 D.
	O.S. -.50	20.	-1.75
8.	1 Eso.	21.	plus 2.50
9.	10		
10.	20/6		
11.	6/4		

ANALYSIS

1. #23 X 2
2. B. I.
3. #15
4. Neg.
5. Pos. X 2R
6. Neg.
7. Neg.
8. Neg.

This case being myopic in one eye and hyperopic in the other, we classify it as a combination E and H. Especially when the amount of ametropia is about equal but opposite.

CASE #29. Male, Age 6. CLASSIFICATION D

Poor grades in school. N.V.A. -0.D. 20/20, 0.S. 20/60 V.A.- through #7, 20/20 0.U.
Complications: All ductions low. Vertical imbalance at distance and near. #10 and #16 recoveries low. #20 low.

FINDINGS

1.	Neg.	12.	1 R. H.
2.	Neg.	13.	6 Exo.
3.	Ortho.	14.	0.D. plus .50
4.	4 Exo.		0.S. plus 3.50
5.	0.D. Plano	15.	7 Exo.
	0.S. plus 3.00	16.	X/14/2
6.	0.D. plus .75	17.	X/16/10
	0.S. plus 3.75	18.	1 R. H.
7.	0.D. Plano	19.	8 D.
	0.S. plus 3.00	20.	-1.00
8.	1 Exo.	21.	plus 2.50
9.	X		
10.	12/4		
11.	6/3		

ANALYSIS

1. #23 X 2
2. Neg.
3. #15
4. Neg.
5. Pos. X 2R
6. #23 X 3
7. Neg.
8. Neg.

Any case showing decidedly more ametropia in one eye than the other, even though there is a slight amount of myopia in one and the other is hyperopic, as in this one, the classification is that of the higher error.

CASE #30. Male, Age 14. CLASSIFICATION H-D

Poor vision with left eye at distance. N.V.A. -0.D. 20/30, 0.S. 20/300. Through #7 20/20 0.U.
Complications: #10 and #16 recoveries low.

FINDINGS

1.	Neg.	12.	Neg.
2.	Neg.	13.	4 Exo.
3.	Ortho.	14.	0.D. plus .50
4.	8 Exo.		0.S. -2.50
5.	0.D. plus 1.00	15.	5 Exo.
	0.S. -3.00	16.	X/26/10
6.	0.D. plus 2.00	17.	X/24/10
	0.S. -2.00	18.	Neg.
7.	0.D. plus 1.00	19.	12 D.
	0.S. -3.00	20.	-3.00
8.	1 Eso.	21.	plus 1.50
9.	8		
10.	24/8		
11.	12/8		

ANALYSIS

1. Neg.
2. Neg.
3. Neg.
4. Neg.
5. Pos. X 2R
6. Neg.
7. #5
8. Neg.

The greater error being that of myopia, the first letter in the basic classification is H. Should the refraction change through reconditioning to the extent that the hyperopic manifestation in the right eye becomes greater than the remaining myopia in the left eye, the classification becomes D-H.

CHAPTER FOUR

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Interpretation of ocular symptoms dealing with information necessary to understand causitive background of the patient's complaints, and using each of the thirty case records in Chapter Three, covering many variations according to age, sex, and patient's environment.

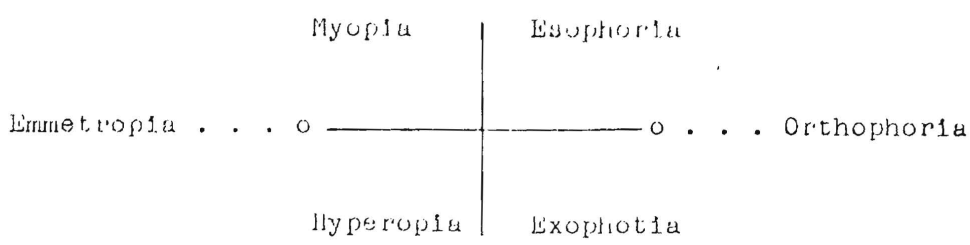
Myopia
Esophoria
Emmetropia . . . o
o . . . Orthophoria
Hyperopia
Exophotia

Fig. No. 4

Chapter Four

INTERPRETATION OF OCULAR SYMPTOMS

According to the basic principles in Chapter One, it will be readily seen that the interpretation of ocular symptoms from a localized ocular standpoint, can no longer be considered as sound practice. In fact, clinical observations tend to show that the various findings in an optometric examination are primarily an expression of basic psycho-physiological disturbances, modified or exaggerated by environment and local demands. With that in mind, it follows that the mere prescribing of lenses or prisms for constant wear to neutralize the manifestation may not always be beneficial to the patient, even if it does obliterate the symptoms. That has already been well established with regard to minus lenses and prisms so it only remains to include plus spheres, cylinders and tinted lenses in the same category.

To clarify what is meant, figure four on preceding page may serve to aid in conveying my point.

Considering myopia, hyperopia, esophoria, and exophoria as the four basic manifestations of general psycho-physiological disturbances, we note that myopia and esophoria are both above the zero line, denoting over-focus and over-convergence. Whereas, hyperopia and exophoria are both below that line and are therefore considered the opposite. On that basis, if it is correct to reduce myopia, esophoria, and exophoria, the same should

apply to hyperopia. That is, the prescribing of plus spheres for constant wear should only be as a last resort after the manifestation has been reduced as much as possible, and then the amount of lens power prescribed for support should only be enough to produce adequate vision.

For practical purposes the following complications have been found to indicate general metabolic disorders:

When the distance ductions are both low; when the near ductions are both low; when there is a vertical imbalance; when there is cyclophoria; when the static retinoscope finding, the distance base in duction, the induced phoria at near, and the base in duction at near are all low; also when the accommodative amplitude is low in relation to the age of the patient. All of the above disturbed findings denote retention of waste products in the tissues.

The ocular manifestations of tension or irritation are as follows: When any of the blur out tests are low. However, the near blur out tests must be considered in pairs, and somewhat according to age. For example: in children, the base in and base out blur out tests may be regarded as low when they total less than twenty-four prism diopters. In young adults, less than twenty prism diopters total may indicate tension; whereas, the minus and plus lens blur outs should not be less than four and one-half diopters for the first group, and not less than four diopters for the second age group. This will also receive further attention in succeeding

pages. It is mentioned here mainly to show that all symptoms and abnormal findings must always be evaluated in accordance with the age, sex, and other factors pertaining to the individual.

Another combination of findings which signifies tension is when the distance and near base in ductions and the plus lens blur out are all relatively lower than the base out ductions and minus lens blur out, provided that such complications are found in connection with the B,D,E,G, and H basic classifications. A low minus lens blur out in any case points to retarded development or interference with glandular function, usually associated with an emotional upset.

Clinical observation on hundreds of cases has led to the conclusion that low recoveries in duction tests point to general disorders incited by localized malfunction in the alimentary canal or the sex organs. Accordingly, in this method of analysis and interpretation of ocular symptoms it was found necessary to divide the combined functions of the entire body into two categories or systems.....e..g. Those directly related to growth and rebuilding or nutrition, of which the digestive tract is the center of activity, and those closely associated with the organs of reproduction, such as the sex organs, genito-urinary tract, the thyroid gland, etc.

It was found that whenever, the base out duction recoveries #10 and #16 were decidedly lower than the expected, a physical examination revealed various pelvic disorders, and other disturbances arising from such afflic-

tions. On the other hand, when the base in duction recoveries were low, an examination disclosed digestive disorders, malnutrition, etc. In short, a low #10 and/or #16 recovery indicated dysfunction of organs supplied mainly by the splanchnic nerve, and when the #11 and/or #17 recoveries are low, those organs receiving their main source of energy by way of the pneumogastric nerve are affected.

Please bear in mind that the foregoing, as well as the following statements relative to the meaning of symptoms and various complications, are the result of clinical observation and are not to be considered from the standpoint of scientific laboratory determinations. On that basis, low recoveries are to be interpreted as follows:

When either the distance, the near, or both base out duction recoveries are lower than the expecteds, we suggest some type of disturbance in the reproductive system of that body. On the other hand, if either one or both of the base in duction recoveries are low, it points to some form of disorder in the metabolic or nutritional system of that body. We are well aware of the fact that these two systems always work together as though they were one unit. However, when we consider the reproductive division either anatomically or functionally, we are compelled to admit that the center of activity is in the pelvic area, or more specifically, the sex organs; whereas, the more important part of the nutritional domain is the alimentary canal.

Another point to bear in mind is that the emotions are closely related to reproductive organs because, when an individual is afflicted with any type of pelvic disorder, he will also exhibit one or more signs of being emotionally upset, such as irritability, hypertension, rapid heart, hyperthyroidism, etc.

Due to the fact that the two systems interact at all times, he may also be suffering from loss of appetite, spastic constipation, and digestive disorders, but it will be found that any malfunction in the digestive apparatus is usually relieved by anything which modifies the emotional upset. However, if the seat of his difficulties is in the nutritional system instead of the reproductive, we find that the digestive disturbances exist almost continuously until specific treatment for alleviation of such disorders has been instituted.

Although, diagnosing systemic ailments is outside of the optometrist's sphere of activities, he must know how various forms of general psycho-physiological disfunctions affect the visual apparatus.

To apply this information in a practical way, the following analytical routine has been evolved. The routine is divided into eight steps, and to simplify it, we utilize only four frequencies which are designated as "basic analytical frequencies" because the various complications denoting metabolic disorders would require a stimulus such as #23 which tends to induce an increased flow of secretions, increased motor activity, and improved oxidation. It will be readily un-

$\angle\delta - \angle\theta$ or $\mu\delta - \mu\theta$

derstood that when such a train of activities is set in motion, the result will have a cleansing effect on the tissues through the circulation.

Frequency #5, being a motor depressant, is called for whenever there are signs of tension. #24 is indicated in cases of asthenopia and photophobia, whereas, #15 is called for whenever the syndrome indicates lowered response in the involuntary system, associated with an emotional upset. All other frequencies either modify or intensify any one of the four mentioned above. Their relationships will be considered later in this chapter.

Step #1. Observe all ductions. If both distance ductions are low or both near ductions are low, it is recorded as #23. If all ductions are low it is #23 X 2.

Step #2. Observe all phorias. If the grand average is esophoria, it indicates prisms base in. If the grand average is exophoria, prisms out is called for. If borderline, i.e., if it is difficult to decide whether it is esophoria or exophoria, this step is negative, or is regarded as orthophoria.

Step #3. Compare #20 and #21 findings. If #20 is relatively lower than #21, it points to #15 frequency in combination with base in or base out, depending on the second step. If #20 is relatively higher than #21 or the two are in ratio, it is considered negative.

Step #4. Compare the distance duction with the distance phoria, i.e., the distance phoria which is taken through the same lens combination as the ductions, which is usually the #8 finding. Determine whether or not they are in agreement. If not, the low duction takes precedence over the phoria. For example: #8 is 2 Eso., #10 is 24/12, and #11 is 6/2. In that case, we would consider them as being in agreement, because in case of esophoria, we expect the base out duction to be relatively higher than the base in duction, which it is, so that step is negative. On the other hand, if #8 were 2 Eso. but #10 were 16/6 and #11 were 10/6, the #10 finding would be relatively lower than #11, which is contrary to what we would expect. Therefore, the ductions are reversed to the phoria. In that case any training would be started with base out in spite of the esophoria until the ductions are again in agreement with the phoria.

Step #5. Observe the recoveries of all ductions. If any of them are definitely low, it aids us in the interpretation of symptoms as follows. Clinical observation and research have revealed the fact that whenever the base out duction recoveries are very low there is or has been some kind of pelvic disorder. On the other hand, if the base in recoveries are very low, it is an indication of past or present disturbances in the nutritional system of that body, as previously explained.

Step #6. In this step we look for additional indications for #23 not covered in the first five steps. Four such indications have been established as follows: (1) when the #5, #11, #13, and #17 findings are all low in the same case; (2) when there is vertical im-

balance at distance, at near, or both: (3) when there is cyclophoria; (4) when #19 is low in relation to the age of the patient.

Step #7. Look for signs of tension indicating #5. The following are such indications: (1) when #9 is low; (2) when the first figure of the #16 and #17 findings are both low as explained earlier in this chapter; (3) when #20 and #21 are both low: (4) when #11, #17, and #21 are relatively lower than #10, #16, and #20, provided the last named is in combination with classification B, D, E, G, and H. All of the foregoing, relative to signs of tension indicating #5 frequency, applies only in cases where there is no pain and/or inflammation, but is associated with symptoms of nervousness and irritability.

Step #8. All of the signs mentioned in Step #7, when associated with pain and/or inflammation, apply in this step and indicate #24 and related frequencies. Also when the patient complains of asthenopia, photophobia, and other symptoms of ocular discomfort.

In addition to the above eight steps, the following rules are applied.

Rule #1. Palliative treatment must precede all other training.

Rule #2. When findings fluctuate radically during the examination, or there is a relatively high exophoria at distance but considerable esophoria at near, or vice-versa, use indicated frequencies alone until the findings are more stable. That is, do not use lenses or prisms with it.

Rule #3. How to prescribe for constant wear; except in cases of absolute necessity or as a last resort, prescribe only the amount of lens power needed for adequate vision. This is not to be considered as inviolate but merely as a fundamental principle which may be applied according to the doctor's judgment.

The following case record will serve as an example for applying the eight routine analytical steps and the reasoning employed for the interpretation of symptoms.

Male, age 55. Eyes ache when he reads and is unable to see small print with his present glasses which are plus 1.00 spheres O.U. for near only.

EXAMINATION

1. Neg.
2. Neg.
3. 4 Exo.
4. 18 Exo.
5. plus .50
6. plus 2.50
7. plus .50
8. 5 Exo.
9. 6
10. 14/4
11. 6/4
12. 1 R. H.
13. 20 Exo.
14. plus 2.25
15. 24 Exo.
16. 8/12/-4
17. 24/28/24
18. 1 R. H.
19. 1.00 D
20. -.50
21. plus .75

ANALYSIS

1. #23
2. B.O.
3. #15
4. Neg.
5. Pos. X 2R
6. #23 X 2
7. Neg.
8. #24

Formerly we referred to such a case as "a presbyope with convergence insufficiency" which gave us no information as to why the findings were that way.

On the present basis, beginning with the first step, we find #10 and #11 both low, which calls for #23 frequency. The second step calls for base out prisms because the grand average of the phorias is exophoria. The third step indicates #15 because the #20 finding is relatively lower than #21. Since the ductions and phorias are in agreement, the fourth step is negative. The fifth step is recorded as positive, times two R because both the #10 and #16 recoveries are low. There being one prism diopter of right hyperphoria at distance and near, it is recorded as, #23 times two, in the sixth step. There are no signs of tension, so the seventh step is negative. Whenever there is pain we employ #24 or one of its related frequencies, and that is recorded in the eighth step.

When #23 is indicated it points to some type of metabolic disturbance of a chronic nature. If #15 is called for, the case is usually one with an emotional background, or some type of glandular disfunction, depending somewhat on the age, sex and environment of the patient. Nervousness, or signs of tension as explained on another page, which call for #5, is also very often the result of emotional disturbances.

In this case we have an indication for #23 three times, pointing to considerable retention of waste products. The indication for #15 is very slight because the #20 finding is

not very much lower than #21, and the age of the patient is such that emotional disorders usually are not as pronounced as in younger individuals. Consequently, we are safe in ruling out the need for #15, as #23 which is definitely called for, also tends to raise the #20 finding.

Continuing our reasoning, we reach the following conclusions: Both of the base out recoveries are low, pointing to a disturbance in the reproductive system of which the pelvic organs are the more important.

With that in mind, we are immediately confronted with the differentiating factors involving age and sex. This being a male, age 55, the type of disturbance to suspect would be a prostatic, bladder, or perhaps adrenal disorder; although the diagnosing of disease is not within the optometrist's realm of service and we are not concerned with that at this time, if we are to practice intelligently on this new basis, we must know something about the various types of general disturbances, which are very often defined in the ocular pattern, so that we may know when a case can be cared for by these optometric means alone, and when other help is needed.

On the other hand, if this were a female of the same age, the most likely condition would be that of an inflammatory process of the pelvic organs, chronic or acute, manifesting itself in the form of an ovaritis, endometritis, malignant or benign tumor, or purely a climacteric chain of syndromes commonly found during the menopause.

If such low recoveries are found in the record of a younger woman, they would be more apt to indicate menstrual disorders, sex repression, causing acute inflammatory processes, in the tubes, ovaries, and vagina; also, in some cases, venereal infections as gonorrhea. Of course, age does not rule out venereal infection but the incidence is greater in younger individuals than in later life.

In children, it points to retarded glandular development of the reproductive division.

These are but a few cardinal points to acquaint the reader with this new approach to the interpretation of ocular symptoms from a general psycho-physiological standpoint.

We are now ready to enter the realm of practical application of these principles.

Case #1. Classification A.

As stated in Chapter Three, these findings are here given mainly to show an ideal ocular pattern and to serve as a guide for determining abnormal findings. It does not mean however, that the findings have to be exactly like this in order to be an "A" classification.

So long as the case is one of emmetropia and orthophoria with good vision and no symptoms, the classification is "A".

If such a case should present itself, and the patient gives as his reason for coming to you that, he just wanted to have his eyes examined to see if they were all right, and the

examination reveals that the classification is "A"; he has good vision and no symptoms but, all the ductions are low, #19 is several diopters lower than the expected for his age, and the #20 finding is also somewhat lower than #21, it would be your duty to explain this to the patient.

Since all the ductions are low, the analysis would show #23 X 2 in the first step, #15 in the third step, and #23 again in the sixth step. All other steps would be negative. The interpretation would depend somewhat on the patient's age and sex. So let us first assume that we have a patient with such a syndrome and that this individual is a male, aged 26.

#23 being called for three times indicates that there is considerable retention of waste products interfering with ocular function. #15 being called for points to an emotional background. This emotional disturbance may be financial worries, a disappointment in love, etc. If the inciting factors are still present, it is sufficient to cause the retention of waste products because any emotional disturbance interferes with circulation and the metabolic processes in general. This can readily be ascertained by asking the patient a few pointed questions. If the inciting factor is no longer present, then you may safely assume that the retention of waste products is due to one of several causative factors, such as overeating, insufficient rest, or other forms of abuse.

Since the patient has no symptoms, i.e., his eyes do not bother him in any way; he merely

came in to see whether or not there was anything wrong with them, and you found that they were not functioning according to commonly accepted standards, and you have reasons to believe that they can be improved, it is entirely up to the patient whether or not he wants to have this form of reconditioning done. At any rate, you have something for him even though he does not need any lenses.

On the other hand, if another individual in the same classification with similar findings presented himself and advanced a similar reason for coming to you, but his age is 40 and states that he had always heard that people after 40 should wear glasses for reading in order to save their eyes, your conclusions would be somewhat different.

The low #20 finding would be more apt to indicate presbyopic tendencies instead of emotional disturbances and the need for #23 would be of much greater significance because the retention of waste products at this age, although more common, is much more serious. In most cases, the functions of the body have already become less active. This should also be explained to the patient and preventive measures instituted. The proper procedure is described in a succeeding chapter.

Still another case in the same classification with somewhat different complications would require an entirely different interpretation. Assuming that the patient is a young girl, aged 13, brought in by the mother for a very similar reason as the two already mentioned. The vision is good and there are no complaints, and being in this classification, no

lenses are indicated, but the #10 and #16 recoveries are very low. Also the #20 finding is considerably lower than #21. The low recoveries indicate a disturbance in the reproductive system of that body and the low #20 finding points to an emotional background. The reproductive or sex organs and the emotions being very closely associated, leads us to believe that this child will soon encounter ocular difficulties if these ocular manifestations are not cared for. It is much easier to do something for this child at this time than to wait until those manifestations develop to the point where ocular comfort is no longer maintained. That is preventive optometry.

There have been thousands of such cases in the past, and simply because they would accept a small amount of plus, it was very often crowded on, but was seldom of any benefit to the patient and in some cases even detrimental, because the eyes being a part of the body, even a small amount of plus, set in motion a train of psycho-physiological activities which actually aggravated the underlying causative factors.

To clarify what is meant by causative factors, as well as stimuli and responses, on the basis of this new approach from a general psycho-physiological standpoint, the following sub-divisions may serve to convey what is meant.

CAUSATIVE FACTORS:

Sub-divisions:

PHYSIOLOGICAL:

Children's diseases, like: Measles, Whooping Cough, Scarlet Fever, etc.
Degenerative diseases of middle and advanced age, like: Brights disease, Buerger's disease, arthritis, diabetes, ulcerative and cirrhosed conditions of the gastro-intestinal tract, genitals, veins, and arteries.
Malignancies, like carcinoma, sarcoma, etc.
Focal infections, injuries, toxomias, overwork, under-nourishment.
Congenital causes handed down from parents.
Syphilis, blood diseases.

EMOTIONAL:

Worry, anxiety, fear, hate, anger, sex neuroses, etc.

STIMULI

(PHYSICAL)

IRRITANTS:

Drugs, such as coffee (caffeine), tea, (theine), strychnine, adrenalin, capsicum, etc.
Sound, the kind usually referred to as noise, depending on the frequency and type of rhythm.
Sharp objects and rough surfaces.
Relatively intense light and the red-orange-yellow portion of the spectrum, etc.

DEPRESSANTS or SEDATIVES:

Drugs, such as opium, morphine, the various barbitals like allanol, mydol, hexin, pyramidon, pheno-barbital, aspirin, alcohol.
Heat and high humidity.
Sound, such as music of the kind that soothes, usually of a low sonorous tone, etc.
Smooth, soft objects and surfaces.
Subdued light and the blue-indigo-violet portion of the spectrum, etc.

STIMULI
(EMOTIONAL)

IRRITANTS:

Unsatisfactory environment, under which may be listed such as being nagged, mismating; and in children, being often innocently punished, etc. Fear, anger, hate.

DEPRESSANTS or SEDATIVES:

Worry. Excessive sex activity or excessive masturbation. Disappointment in love, etc.

RESPONSES
(PHYSICAL)

CONTRACTION: (CONSTRICTOR)
Contraction, tension and spasm.
Increased secretions. Increased metabolism.
Decreased absorption.

(EXPANSION: DILATOR)
Expansion or dilation and relaxation.
Decreased secretions.
Increased absorption.

RESPONSES
(EMOTIONAL or MENTAL)

CONTRACTION:
Pain, discomfort.

EXPANSION:
Pleasure, relief, etc.

Perhaps the most common emotional disturbances met with in optometry, especially in young individuals in the 'teens and young adults, complaining of ocular discomfort but showing only a small amount of refractive abnormality, is due to sex repressions or neuroses. Yet, that phase has been almost entirely overlooked in the past. The ocular pattern indicating such disturbances will be pointed out in a number of the succeeding examples. The correctness of this can easily be verified by an optometrist by referring to case records in his files, of individuals with whom he is well acquainted.

Case #2.

Here we have an individual who has never worn glasses, except for reading, and already possesses the proper reading lenses.

There is nothing in the way of lenses for constant wear that will help him. As nearly as it can be determined, the only reason for his lowered visual acuity is the lenticular opacities.

On the basis of former optometric procedure, nothing can be done in the form of orthoptics to improve his vision.

The analytical procedure on this basis very clearly shows that there is considerable retention of waste products. By applying that portion of the light spectrum designated as #23, the following demonstrable activities are set in motion; first, an increase of the flow of secretions; second, increased motor activity; and third, improved oxidation. However, he already complains of his eyes watering too much, so it would not be well to apply that particular frequency until the excessive lachrymation has subsided. For that reason, we apply the rule that "palliative treatment must precede corrective procedures," which will be fully covered in the succeeding chapter. At this time, we are primarily interested in the interpretation of his symptoms so it may be stated that the epiphora is the result of irritation due to the waste products retained in the tissues. At the same time, in an individual of this age, we may safely assume that even the lenticular opacities are the result of stagnation.

If, after a few applications of such a procedure, the vision is decidedly improved, we would have reason to believe that our assumption is correct. If not, the case would have to be referred to others for further investigation.

Case #3.

In this case, the ocular pattern shows absolutely nothing wrong. But the patient has a slightly lowered visual acuity and is uncomfortable. According to past methods, very likely a small amount of plus would be pre-

scribed, simply because this patient would accept possibly plus .50 to plus .75 without blurred distant vision. The induced inhibition resulting from such a procedure might even modify the subjective symptoms and lead the practitioner, as well as the patient, to believe that such lenses were beneficial.

Almost every optometrist will agree that there have been thousands of such cases. The analytical procedure shows all steps negative except the eighth, which calls for #24 because of the subjective symptoms. Since #24 is primarily a sedative frequency, the corrective frequency associated with it is always #23. Therefore we arrive at the conclusion that the subjective symptoms are the result of retention.

Case #4.

This is one of the types that has been very much misunderstood in the past. Nearly every refractionist insisted on giving the full plus acceptance. While the prescribing of plus would not be actually detrimental in this case, the mere prescribing of such lenses would tend to obliterate the ocular symptoms and leave the underlying causative factors untouched. Even the former methods of orthoptics would very likely no more than obliterate the symptoms by changing the localized ocular pattern with base in prism orthoptics.

The important factor to consider as an immediate cause of the symptoms is that of tension, indicated by #11, #17, and #21 findings, being all relatively lower than #10, #16, and

#20. Although #23 is called for two times in the sixth step, we need not give that serious consideration in an individual of this age. The tension which is manifest in the ocular pattern very likely exists throughout the body, interfering with circulation which results in retention of waste products. The application of #5 frequency, together with base in prisms during the training period, induces expansion. This removes the interference to circulation, which will quickly carry away the accumulated debris.

The next point to consider is the low recoveries in #11 and #17. This points to a disturbance in the nutritional system, so we conclude that this syndrome is the result of dietetic shortcomings. Should this be an only child, the fault is more apt to be in the direction of too many treats, such as candy, pastry, and the like, which must be modified if the results are to be relatively permanent. On the other hand, if this child comes from a very poor family, it may be a case of malnutrition, and unless that condition can be changed, very little can be done in the way of reconditioning.

Case #5.

Comparing this case with Case #4, we find there is a decided similarity from the standpoint of refraction, but the background is of an entirely different nature.

In the majority of optometric offices, these two cases would have been considered as being very similar from the standpoint of interpretation of symptoms. Again, plus lenses would

have been decided upon as the remedy. But in this case, any amount of plus would be decidedly detrimental. The analysis also indicates retention of waste, but at this age, we do not take such indications very seriously. At least, we do not consider it a basic causative factore. The more important point is this case is the low #20 finding and the low recoveries in #10 and #16. When such abnormal findings appear in the same case, we regard it as a disturbance in the reproductive system, and considering the age of this patient, a disturbance of that nature is very probable.

On the other hand, if the patient were a male past 15 with similar findings, the disturbances would very likely be of an entirely different nature because the functions involved would be more developed and the emotions much more intense. Also venereal disease may well be suspected in a syndrome of this kind. In a boy aged 12 however, we merely consider the disturbed ocular pattern as a manifestation of the development of a new bio-physical activity in that body and, therefore, nothing particularly serious.

Case #6.

This is another case where former optometric means offered very little in the form of improvement.

In the main, the causative background is again one of waste retention, but in addition to that, the #11 and #17 recoveries are manifestations of additional complications in the nutritional system. This means if the

patient has definite digestive disturbances, they would have to be cared for by a general practitioner.

However, if the vision improves rapidly and the recoveries in question come up after a few training periods, we may safely assume that the body is still able to cope with the condition without aid from a physician.

Case #7.

This is the type of case that has caused many refractionists a great deal of concern. These are commonly referred to as presbyopes with convergence insufficiency. A certain amount of plus add is needed for clear vision, but the patient is unable to accept it because of the high exophoria at near. The term "convergence insufficiency" gave us very little information.

According to the analysis, Both #15 and #23 are indicated as corrective frequencies. #15 being the emotional stabilizer, is called for because of the low #20 finding, but it is not very important in this case; first, because the emotions are not very intense in an individual of this age, and second, because the #20 finding is only slightly low. However, #23 is very important in these cases, even though it is indicated only once in the analytical routine. Since the recoveries in #10 and #16 are very low, pointing to a disturbance in the reproductive system, the most logical disorder to suspect in a male of this age is a prostatic involvement. As optometrists, we are not concerned with the diagnosis of physical conditions or their correc-

tion, but we must know something about the general background associated with certain abnormal ocular findings, so that when we apply our remedies to correct the ocular difficulties, we may know when a case must be referred to someone else. In this case, if #10 and #16 recoveries do not come up immediately after a few training periods, the case is not amenable to orthoptic training alone. A few pointed questions about physical symptoms that usually accompany disorders in the pelvic area will verify your findings.

Case #8.

The findings and even the analytical routine are quite similar to those in Case #7. But as the age and sex of the patient are different, we reach an entirely different conclusion in the way of a causative background.

This being a young female just entering adolescence, it is not difficult to understand why there should be disturbances in the reproductive system as indicated by the low #10 and #16 recoveries. Although great stress was laid in the past on the small amount of hyperopia, almost anyone who has practiced any length of time will readily agree that any amount of plus was hardly ever accepted with comfort in cases of this kind. But it was prescribed anyway because it was believed that the ocular symptoms were due to the "uncorrected hyperopia".

In spite of the fact that these patients were usually more uncomfortable with any amount of plus prescribed, they were told that they must wear their glasses all the time and that

they must get used to them. Very often they went to several refractionists but were always given the same advice until they were finally convinced that their eyes were very bad and that nothing more could be done for them. Those who instituted orthoptics on the old basis merely "built up the convergence" which obliterated the symptoms in some of them, and it was believed that the condition had been corrected.

Case #9.

This is another type of case that has been commonly referred to as convergence insufficiency. Any amount of plus would aggravate the patient, and at this age, no improvement would be obtained with the aid of a lens. Various forms of orthoptics gave some relief but seldom of very long duration.

The main reason for the blurred vision is the waste products which interfere with proper function. This is commonly referred to as toxic interference but, on physical examination, these patients are usually given a clean bill of health, very likely because the physician depends on blood-pressure, urinalysis and other laboratory findings which may all be negative in this type of case.

The ocular pattern, however, clearly indicates this interference by a lowered convergence and a vertical imbalance. Another individual with a similar background might show this type of interference in the ocular pattern in a different way. That is the reason why we have tabulated several syndromes which indicate a metabolic disturbance of some

kind. For example: a case with the same amount of hyperopia associated with esophoria instead of exophoria, showing the #5, #11, #13, and #17 findings all lower than the expected would be such a case, i.e., the corrective procedure would differ only in the prism placement.

Case #10.

This is primarily a refractive case. However, if we consider astigmatism a complication resulting from a disturbed basic pattern, either inherited or acquired, we may well expect a decided reduction in the amount of astigmatism over a period of several years if the case is properly handled. The analysis at this time shows only one positive step which is #7, indicating #5 frequency, which means that a certain amount of tension is present. The fact that there is a considerable amount of hyperopia is an indication of a lowered tonus in the involuntary muscle system, of which the ciliary muscles are a part. This in itself is sufficient reason to assume that a great deal may be done for this child in the way of reconditioning. This will be dealt with at length in Chapter Six under Reducing Ametropias.

Case #11.

This is another type where the mere application of lenses gave satisfactory end results from the patient's standpoint, but actually the symptoms were only obliterated by that method alone. In other words, the mere fact that the symptoms were no longer present is not proof that the condition had been properly cared for.

Any number of such individuals have obtained ocular relief through the refractionist's service, only to develop various physical conditions which were never associated with his former ocular symptoms.

The analysis calls for #15 in the third step. This, being the emotional stabilizer, immediately reminds us that we are dealing with a case having an emotional background. In this instance, it is verified by the lowered recoveries in #10 and #16 findings. There is sufficient hyperopia to warrant a certain amount of plus lens power for support, but the total amount acceptable to the patient is very definitely detrimental, because it tends to inhibit a muscular system which is already low in tonus.

Case #12.

Whenever all the ductions are low, the individual is chronically ill whether he knows it or not. Unfortunately however, many of these individuals go the rounds from one physician to another only to be told that there is nothing wrong with them except their eyes. On the other hand, they also go from one optometrist to another only to be told that they must see a medical eye specialist, and when they do go to an ophthamologist, they are usually informed that there is nothing to be done except to operate.

With the advent of these modern optometric means, it is very often possible to not only arrest the progress of their affliction but sometimes obtain considerable improvement. At this point, I wish to go on record as

being definitely opposed to optometrists attempting to correct physical disorders. The alleviation of ocular discomfort and improvement in vision by optometric means...light, lenses, and prisms...applied to the eyes cannot be considered as anything other than the practice of optometry. The fact that I frequently mention various physical conditions associated with definite ocular syndromes and advise the use of certain specific spectral bands in such cases, is not intended to mean that the general physical condition is being treated. The general improvements that very often follow the reconditioning of a pair of eyes by this method is attributed to the fact that the human body is self-adjusting. All that man can do is to remove obstacles which interfere with the compensatory and rebuilding powers of that body. However, we recognize the limits of the body to readjust itself.

In our work such a condition is recognized when the patient does not respond, i.e., if symptoms of discomfort do not subside; or in case of lowered visual acuity, it does not improve. In most cases, if there is relief from symptoms or improvement in vision, there is also a change in the findings toward the expecteds. But that is not imperative....it is only desirable....and usually does happen. If the changes in the patient's subjective symptoms are satisfactory and the findings do not change, then we use localized ocular training as commonly employed in the past, except that we do this as a last resort, whereas formerly, such localized methods were employed in the beginning.

The analysis in this case calls for #23 four times. All other findings are negative. Consequently, we would apply this frequency without changing the pathway of light. Accordingly we conclude that the cause of this patient's condition is faulty elimination.

Case #13.

Unfortunately, it is altogether too easy to obliterate symptoms. Whether it is plus lenses for hyperopia, tinted lenses for photophobia, laxatives for constipation, or opiates for pain, to a certain extent they fall in the same categories.

The question should always be "Why are the findings as they are?", "Why the esophoria in a given case?", "Why a low recovery?".

This type of ocular syndrome presented real grief in the past. In fact, those unfortunate individuals very seldom obtained more than temporary relief regardless of where they went. The total amount of plus indicated in the #7 finding is always gratefully accepted because it does give a sense of relief, and yet, that total amount is very definitely contra-indicated as shown by the decided increase in esophoria through that amount of lens power. The syndrome is one of irritation which is definitely aggravated by localized inhibition. The extremely low recovery in #17 indicates that the seat of the irritation is very likely in the alimentary canal. Due to this condition, the individual is unable to relax, which still further interferes with proper function. A vicious circle is set up and any interference

from a localized standpoint may produce temporary relief but aggravates the basic disturbance.

Actually, this is not an ocular case from the standpoint of refraction. It merely manifests itself in the ocular pattern. Modern optometric methods enable the optometrist to do more for these patients than anyone else because the disturbance, although basic, is mainly functional, and in the absence of demonstrable pathology, the physician hardly ever finds anything wrong except that he may prescribe something for what is commonly referred to as dyspepsia. With the proper procedure on this new basis, the patient is enabled to relax by the application of #5 frequency, combined with prisms base in. This removes the interference to function and the body readily corrects itself.

The high esophoria at near sometimes remains as an aftermath, but is then easily modified by the proper procedure which is explained in succeeding chapters.

Case #14.

This is perhaps one of the most common types of ocular discomfort in this age and sex group, and another one of those which has been very much misunderstood in the past. They were also very much mistreated, not only by optometrists but by general practitioners as well.

Everyone treated these cases according to their own particular specialty or pet idea. The old-time family doctor usually gave them

some consolation at least, by telling them that they would have no more difficulty after the birth of their first child. They came to the optometrist because of their occipital headaches, and if they were so unfortunate as to accept even plus .25 sphere, they were said to be latent hyperopes, and were forced to walk around with blurred vision for months because this did sometimes give them some localized ocular relief, but the basic disturbance causing these ocular symptoms were actually aggravated, but hardly ever associated with what was being done to their eyes. Their physical complaint to the physician was that of dysmenorrhea. Usually the physician had already tried the more common remedies, and since the patient complained of getting worse, very often the more radical means of surgery were resorted to.

By means of the ocular reconditioning, described in Chapter Five, relief from ocular discomfort is quickly and easily obtained. In addition to that, the patient is very pleasantly surprised by the decided improvement in other functions which had caused so much trouble in the past. All this sounds like the practice of medicine or more specifically, gynecology. Actually, however, it is far removed from that field, and is very definitely THE PRACTICE OF MODERN OPTOMETRY, mainly because the modern optometrist who practices his profession on this basis has the most effective and most rational remedy for such ocular discomfort. Furthermore, he stands almost alone in the field of therapeutics today to understand the general psycho-physiological disturbances which produce this type of syndrome. The application

of this form of training is primarily a matter of setting in motion a train of psychophysiological changes which result in a redistribution of energy. This harmonizes the ocular pattern, but it does not stop there. These changes are transmitted to all parts of the body, and unless the condition has progressed beyond certain limits, that body will correct itself.

Even if we knew nothing about the basic disturbances associated with this type of ocular syndrome, our remedy would by no means be less effective. But it is generally agreed that if ocular symptoms are associated with general disturbances, the optometrist should know more about it, and our present-day four-year optometry courses afford ample time for the inclusion of such information.

The general background of this syndrome is of an emotional nature which very likely had its beginning during the change from puberty to adolescence. Lest the reader interpret my explanatory remarks of comparison between the former methods and this new approach as condemnation of past methods, it may be stated that it is not intended that way. New discoveries made it possible to produce phenomena which were not explainable on the former basis, and it was necessary to find reasons for such phenomena. As a result of this search for new facts, an entirely new philosophy was evolved. The comparison between the old and the new, appearing from time to time in this work, is presented for clarification only. To summarize, this syndrome points to a disturbance in the reproductive system, with an emotional background,

resulting in faulty metabolism. The condition is greatly exaggerated in the ocular pattern due to the great number of sensitive nerves and intricate vascular system. The eyes, being the most highly specialized end organs in the body, where the blood is transferred from the arterial to the venous system by means of osmosis, any disturbance in the metabolism results in the accumulation of waste products in that area and irritates the nerves.

In addition to the ocular syndrome, these patients present other symptoms, such as frequent crying spells, bad dreams, palpitations of the heart, etc. Very often, a diagnosis of hyper-thyroidism is made, but the treatment for it, is hardly ever of lasting benefit. Thousands of young women in this classification have been mutilated surgically, by the removal of sex organs. Such an operation eliminated the dysmenorrhea but usually aggravated other symptoms, especially their ocular difficulties.

Case #15.

Whenever all the recoveries are low in a child of this age, the general physical background is very poor. If this child comes from a well-to-do family, it is usually due to rich foods, too much pastry, candy, etc.; also over-attention. The child has too much care and is not allowed to develop normally. More often, however, children with a syndrome of this kind come from poor families and in that case, it is malnutrition, and there is very little we can do about it as optometrists except to supply the best possible lens

and improve the ocular functions enough to obtain fairly normal vision.

#15 and #23 are both called for as corrective frequencies and the need for both is very decided. That is, the #20 finding is very low, showing that the involuntary response when it is unassisted by convergence, is very poor.

At this point, I may state that clinical observation of many such cases points to glandular dysfunction. This is my personal conclusion, based on the following observations.

If, what little is known about glands is correct, the involuntary muscle system is dependent on internal secretions in order to function properly. In the physical therapy department of the writer's own practice, #15 frequency was used in many cases of glandular dysfunction and most of these cases greatly improved under that treatment. In the majority of such cases, the ocular examination disclosed a low #20 finding, and without treating the eyes, but applying #15 and its related frequencies on other parts of the body, it was found later that the #20 finding had also greatly improved. I do not claim to be an endocrinologist, but make these statements and draw these conclusions assuming that what is generally written about glands by those who claim to know, is correct. Whether my explanation is correct or not, does not matter. The fact remains that the patients improve both ocularly and systemically, regardless of whether the light is applied to the eyes or other parts of the body. However, it was found that the improvement in both the eyes and the body in general is quicker and more pronounced when the corrective means are applied optometrically.

Since there are four indications for #23, and the #11 and #17 recoveries are both quite low, the nutritional system of the body is very definitely interfered with by waste products. In short, the low vision is due to faulty metabolism and an under active glandular system. Fortunately, the rebuilding powers are very high in a child of this age, and many of them will respond in spite of the seemingly hopeless background. In fact, this particular child made such a complete change in less than six weeks that it seemed as though the days of miracles had not passed.

At this point, it may be stated that although I am covering these records in this chapter as though they were hypothetical cases, actually, all records except Case #1 were taken from actual practice, and the final outcome of each case is given in the next chapter.

Case #16.

The fact that there is a decided increase in exophoria after the application of plus lenses, should be sufficient reason to look for other causes than the hyperopic manifestation. At any rate, the total amount of plus acceptance is very definitely contraindicated and if the plus is reduced, the #20 finding would be still lower. Considering this poor response to stimuli in the involun-

tary muscle system of which the ciliaries are a part, the total amount of plus lens acceptance would actually be detrimental in such a case, even if it were not accompanied by the increase in exophoria. As previously stated, clinical observation points to some type of glandular dysfunction in any case where the involuntary response to stimuli is poor. To arrive at a satisfactory conclusion in these cases, it is necessary to thoroughly investigate environmental conditions.

Since a low #20 finding calls for #15 and its related frequencies, which are #14 and #13 on the stimulating side, it is well to determine, if possible, which one of the three frequencies is most important. For example: the most outstanding property of #13 frequency is that of respiratory stimulation; that of #14 is vaso-constriction; and #15, emotional stabilization. As optometrists, we are not concerned with general physical activities but whatever we do to the eyes must be in harmony with other functions of the body of which that pair of eyes are a part. Unfortunately, we have no other way of designating the properties of any selected spectral band, except by the type of response elicited from a general standpoint. The ocular findings and subjective ocular symptoms merely give us the differential information that is required to obtain the most satisfactory end results.

In the past, we often made such crude statements as, "Red stimulates", without considering differential responses between various shades of red which are actually different rates of vibration, and do elicit differential

responses. When #13, #14 and #15 are compared as to color, even though they are all red, there is a decided difference in shades. Hence, to determine which one of the three is most effective in a given case, we are as yet compelled to observe various characteristics and appearance of the patient.

Since the main property of the #13 is that of respiratory stimulation, and we note that the patient's breathing is very shallow, we would regard #13 as the most logical frequency to employ. However, we must carefully weigh this bit of evidence against other characteristics and behavior. Ordinarily, the emotions are not very intense in a child of this age, unless the environment is of the kind that upsets the average child. In that case, #15 would also have to be considered as a part in the corrective procedure. #14 is hardly ever indicated specifically in a patient of this age because it is mainly called for in conditions more prevalent in adolescence and adults under 40 or 50 years of age, such as low blood-pressure, deficient abdominal circulation, etc. These explanatory remarks are intended to acquaint the reader with the fact that intelligent application of these methods requires a broad knowledge of the various contributing factors in the environment of a given individual in relation to age, sex, and general behavior.

More pages than are contained in this entire volume could be written on that phase alone. One of the main reasons why that subject is so complex is the fact that every individual is a combination of many reflexes; some innate, some inherited, and others acquired.

The innate reflexes are practically the same in all individuals.

The inherent reflexes, however, differ greatly, even in the same family. There may be six or eight children in a family, and they may look and act like a group of orphans brought together from different parents and various parts of the globe. The reason for this is that one child has inherited more of the father's characteristics than those of the mother, less of the father's father than the father's mother, and more of the mother's mother than the mother's father, and so on back through the generations. Another child may have inherited an entirely different pattern.

The acquired reflexes are the result of the inherent reflexes and the environment, which again may differ considerably in the same family. A child with a different set of reflexes will respond differently in the same environment.

The analytical routine gives us the general indication and a clue to the background which must be corroborated by the various physical signs in relation to the other factors mentioned above.

Case #17.

Interference due to retension, commonly called toxic, is very frequently encountered in an optometric practice. In fact, very few individuals are free from it at all times. The main difficulty has been that many of them who were referred to their physician by

the optimetrist, in case he recognized the indications, returned to him with the statement that their physician found nothing wrong physically. Sometimes they were informed that it must be their eyes and they had better consult a real "Eye Specialist" and the case was lost to the optometrist who referred it.

By this method of analysis, the more important contributing factors are easily recognized, and in most cases the proper reconditioning brings about sufficient change in ocular function that the circulation will carry away the waste products which had formerly been retained. If that takes place the patient will be quickly relieved and the findings will change toward the expected, on the other hand if the syndrome is due to a focus of infection, the patient may be temporarily relieved but the findings usually remain about the same.

The analysis calls for #23 twice in the first step and once in the sixth step. In addition to that, the fifth step informs us that all recoveries are low. With such a syndrome in the ocular pattern of an individual age 55 or older, we immediately think in terms of chronicity. Therefore, it is well to have a very complete history and in case the patient has had one or more major operations or has been treated for physical ailments, the results of such remedial efforts should be ascertained.

That is, whether the response to past treatments was good, fair, or poor. If the answer is favorable we may also expect satisfactory

end results. However, if the patient states that she does not feel any better now, than she did before an operation or other treatment, the prognosis is doubtful. In any event do not expect a case in this age and sex group with this type of syndrome to improve rapidly. Since all recoveries are low, we would suspect both, pelvic disorders and digestive disturbances.

Case #18.

Considering the causative background of an elderly individual with this type of syndrome, we encounter obstacles which are often difficult to cope with. At that age, the average patient's responses are relatively slow, which requires the more extreme stimuli, but the subjective symptoms are such that intense stimulation aggravates the symptoms due to localized tissue irritation. Therefore, it is necessary to begin very cautiously and modify the more important manifestations for the purpose of obtaining immediate localized relief. This will be described in detail, in the succeeding chapter.

For the present, we are primarily interested in determining, if possible, what the various contributing factors are. The most important point to consider in the analysis is the extremely low recoveries, in the #10 and #16 findings, indicating as it does a disturbance in the reproductive system of the body of which the pelvic organs are the center of activity, the most logical type of disorder to suspect is that of prostatic dysfunction. Usually a few pointed questions will serve to verify our assumption. A common symptom

associated with such disorders is that of frequent urination, more noticeable during the night because of the need for getting up several times, also the sensation of weakness or dull pain in the lumbar area (lower portion of the back). In addition to that, these patients very often complain of a feeling in the back of the thigh, and calf of the leg, as though the muscles were too short, or stiffness, as some refer to stiffness in the back of the neck as though some of the muscles were too short, similar to that complained of in the back of the leg. The low #20 is usually of very little importance in a patient of this age. However, after the patient has been made comfortable and the exophoria is still relatively high, or the blood pressure happens to be somewhat low, #15 and its related frequencies will be of benefit to complete the case.

In fact it may be stated that the failing vision in connection with this type of syndrome points to low blood pressure and other physical conditions usually associated with it.

Case #19.

This syndrome is mainly one of hypertension, and it is difficult to determine what the inciting factors are, unless we obtain a very complete history, and even then it is more or less speculative. However, since we do have the remedy we need not be so much concerned with the cause.

Since the #11, #17, and #21 findings are all relatively lower than #10, #16, and #20, denoting tension due to some type of irrita-

tion, it is possible that the beginning of this disturbance may have been one of the so-called children's diseases, such as measles, whooping cough, scarlet fever, etc. Any one of those diseases cause considerable disturbance in the nervous system at the time, and the body is unable to regain its equilibrium.

When we consider this ocular pattern in relation to the age and sex it is also possible that the development of a new bio-physical activity which takes place in the early teens may be the primary cause of the irritation.

Further research may reveal something more positive than we now have.

Case #20.

In relation to this patient's age and sex, it is unlikely that the primary cause of his subjective symptoms is in the eyes. Lenses alone will not solve his problem. There is no definite indication for the former type of orthoptics. That is, the pattern is fairly well balanced, and the source of irritation is almost entirely due to waste products interfering with function.

The analytical routine shows the need for #23, four times, and in addition to that all recoveries are low, which is satisfactory evidence that the condition is chronic and of relatively long standing, involving practically the entire body.

It is well to bear in mind that the underlying condition may be the same in many individuals, but the manifestation will be different in each one because any condition developing within the body will become manifest at the point of least resistance, or greatest stress. The same combination of basic disorders in another individual may produce digestive disturbances and still another may suffer from circulatory disorders affecting the heart, etc.

The fact that the ocular symptoms are present is not necessarily an indication that there is something wrong with the eyes, and even if the symptoms were eliminated with lenses for constant wear, we have no assurance that it was the proper remedy. By reconditioning a pair of eyes on this basis, however, we find that various basic disorders become greatly modified as the ocular findings improve, and the patient's subjective ocular symptoms subside.

Therefore, we believe that when the ocular mechanism has been restored to harmonious function and interference to general improvement has been removed, the body is again able to cope with and correct many disorders.

Case #21.

The general background in this case is quite similar to that of case #20, except that the metabolic processes are much better and the complaint is mainly that of poor vision.

Since there is no discomfort it is primarily a matter of applying the proper procedure to improve vision, if possible. As explained in the succeeding chapter there must be some

improvement in vision after the first treatment. If not, the case is dismissed or referred to some one else.

Case #22.

The problem of myopia in children of school age has received a great deal of attention in the past. Inherited tendencies, excessive near work, and visceral imbalances are the more common conditions which have been advanced as causes. Visceral imbalances is a general expression covering many types of physical disorders and could mean any one or more of many different types of disturbances.

We can hardly doubt that there are inherent tendencies in some cases, but I question the theory that excessive near work is the cause of myopia. I do not mean, however, that it may not be a contributing factor. The analytical routine in this case points to an emotional background by the appearance of #15 in the 3rd step and this is corroborated by the 5th step which shows two low recoveries denoting some type of disturbance in the reproductive department. Considering this syndrome in relation to the patient's age and sex, we conclude it may be regarded as sex repression. On the other hand, a similar combination of findings may be present in case of venereal disease, various inflammatory processes or obstructions in the pelvic region. Should a condition on the order of the last two named be present, the case is not for an optometrist until those conditions have been cared for. That is, no form of reconditioning should be attempted because the results will be disappointing in most cases.

I am aware of the fact that it is possible to make localized ocular changes irrespective of the cause, but, by the technique described in succeeding chapters, the reconditioning is always in harmony with general physical disorders or psycho-physiological disturbances and the localized ocular symptoms seldom improve without some modification of general malfunction. Therefore, it is always well to determine as near as possible whether or not there are any physical disorders with which the body is unable to cope without the aid of a physician. The indications in the analytical routine usually give us sufficient data for intelligent questioning and when we know the common symptoms associated with various physical disorders, we are in position to draw fairly accurate conclusions.

All this requires a great deal of extra optometric information which must be obtained from the proper source, as it has no place in a work of this kind.

Case #23.

When the myopia has progressed to a diopter or more in a child of this age we have reason to believe that we are dealing with an inherited tendency. Consequently we do not expect rapid reduction of the manifestation. Our aim is primarily, that of arresting the progress.

If one or both of the parents happen to be myopic, the prognosis is doubtful, especially when we consider this syndrome in relation to a young child showing the need for #23 twice in the first step and once in the sixth

step. Also, the extremely low #20 finding which calls for #15 frequency, the emotional stabilizer. At this age the emotions are usually not very intense, so we conclude that this sluggish involuntary response is the result of retarded glandular development. Since the #20 and #21 findings total only two diopters which is very low for this age group. The blur-out points in the #16 and #17 findings being low, denotes positive interference to function resulting in lowered areas of tolerance. The low #19 finding is also a sign of faulty metabolism.

In view of all these complications we may be well satisfied if we obtain comfort and arrest the progress of the condition.

Case #24.

Although this case cannot be handled by an optometrist alone, it is always well to care for that phase which comes under our jurisdiction, namely, that of prescribing lenses to improve vision and harmonize the ocular pattern with optometric means.

Sometimes, the results are very gratifying and the ocular functions are so much improved that the patient will respond much better to any form of treatment by those who are especially trained to care for pathological involvement. Sometimes these conditions are no longer active and in such cases the optometrist is able to do more with these modern methods than was heretofore possible.

Case #25.

The amount of myopic manifestation at this

age very definitely points to an inherited pattern which is fully corroborated by an almost entirely negative analytical routine. Consequently there are only two avenues open for the solution of this problem.

The prescribing of proper lenses for constant wear and/or reconditioning in an effort to reduce the manifestation....the technique is described in Chapter 6 under case #25.

Case #26.

These cases have presented an endless amount of grief to refractionists because they cannot see without the lenses and are actually made more uncomfortable with them, and the myopia increases very rapidly, which is disappointing to both, the patient and the doctor. The analytical routine points to serious complications which when left unchecked result in a vicious circle. More minus lens power is needed to improve the vision which produces a greater amount of irritation followed by more interference to function, causing a greater amount of retention which aggravates the subjective ocular symptoms and that in turn increases the need for more minus and so on and on.

Such individuals were exceedingly unfortunate because, in the past, no matter where they went very little was done for them except the prescribing of more minus to clear the vision, adding more impetus to the existing vicious circle. How to arrest the progress of the condition and modify the disturbance is described in Chapter 5, and how to reduce the manifestation is covered in Chapter 6.

Case #27.

The various findings, except the amount of myopia, are quite similar to those in Case #26, resulting in an almost identical analytical routine except that in this case the 8th step is also negative because there are no symptoms of discomfort, but this patient being much older and not having required minus lenses, which might have aggravated the condition, has maintained ocular comfort.

The reason for the lowered visual acuity of which he now complains is quite obvious and unless the response mechanism is no longer sufficiently active to set in motion the necessary train of activities, this patient will obtain the desired end results.

Case #28.

This being a case of antimetropia, is presented mainly to answer the question that may have entered the reader's mind relative to cases where the basic manifestation in one eye calls for a different basic classification than that of the other. After prescribing the proper lenses to balance the vision we still have a disturbed ocular pattern which requires reconditioning. The background is of an emotional nature, pointing to a disturbance in the reproductive system of the body. There is also an indication of retention which is very likely the result of interference to function caused by the emotional upset.

Case #29.

This case also shows the need for a great deal of reconditioning even after the proper lenses have been prescribed. In fact, the discomfort is very likely not due to what is commonly called eye-strain resulting from the anisometropia or "uncorrected ametropia."

Rarely do we encounter a case of this age showing such a great amount of retention calling for #23 five times. If this boy comes from a poor family it is very likely a case of malnutrition and retarded glandular development, indicated by #15 appearing in the 3rd step and the two low recoveries in the 5th step. In any event when you see a case record of this kind and the patient is under 10 years of age, or in the early teens, it is well to inquire about the dietetic regime, and unless that can also be cared for, if it is faulty, the prognosis is doubtful.

Case #30.

Here is another compound classification that is given for the purpose of clarifying a few points in some complicated and unusual types.

Although the analytical routine shows two low recoveries in the 5th step and calls for #5 frequency in the 7th step, we are safe to assume that those manifestations are the result of localized ocular origin rather than basic. First, because the recoveries are only slightly low and second, the indication for #5 frequency would very likely disappear after the lenses have been worn for several days.

CHAPTER FIVE

***

General procedure and specific techniques relative to various case records which have been presented.

Chapter Five

REMEDIAL TECHNIQUES

Assuming that the practitioner has no orthoptic apparatus but desires to test the principles advanced herein, he may apply the various techniques by inserting the indicated colored glass filters combined with lenses and/or prisms in the trial frame, as described in Chapter One.

Prisms base in, out, up, or down always means the recovery point at the distance where the target is placed. If that distance is 16" the #16 recovery indicates the amount of prism base out and the #17 recovery is the amount to be used for base in. Should a recovery point be less than zero, the prism placement is opposite. For example: a patient may have a very high esophoria at near, which would call for prisms base in during training but the #17 recovery is minus four, that amount is inserted in the trial frame during the training period and although the placement is base out, the affect on the patient is that of base in.

In the analytical routine only four frequencies are employed. They are #5, #24, #15, and #23. They are referred to as basic analytical frequencies. All others either modify or intensify any one of these four. The first two are designated as palliative and the other two as corrective frequencies. In all reconditioning a very important rule to observe is that, a "palliation must preceed correction." The frequencies related to #5,

are #45, which intensifies its action, and #35 is a slight modification. Those related to #24, are #4, and #45 as intensifiers and #2 as a modifier. To #15 are related #35, #5, and #45, on the inhibitive side and #14, and #13 are more intense on the stimulative side. Actually all frequencies are stimuli but, the application of frequencies on the blue-indigo-violet end of the light spectrum induces expansion whereas those on the red-orange-yellow end elicit the type of response that is followed by contraction, and that is the way the terms "stimulation" and "inhibition" are to be considered in this work.

Case #1.

As explained in Chapter 3, Case #1 is primarily an example of an ideal case record showing the expecteds of all findings and is intended as a guide to determine whether or not a finding is high or low. It does not mean, however, that an individual with such findings may not have ocular discomfort such as photophobia, astenopia, etc. In case there is discomfort, the 8th step would indicate #24 or one of its related frequencies.

If the pain is intense begin with #45 and continue until the symptoms subside. Usually a minute or two is sufficient for the patient to report a slight amount of relief. Then remove the #5 filters and continue with #4 until the patient reports still more relief, which is usually only a minute or two; then add #2 filters which is then #24 and finish that training period by continuing for 3 or 4 minutes more. When a patient is treated

entirely according to subjective symptoms, relief from discomfort is the guide to response.

In addition to that, the practitioner must learn to observe various objective phenomena. Whatever is done to benefit the eyes must also benefit supportive functions. Learn to observe the appearance and behavior of the patient before training. If the patient happens to be pale, any improvement in ocular functions will also be beneficial to the circulation, which becomes manifest by a slight change toward a pinkish hue. This is more easily seen on the forehead and the ears. If the voice is relatively high in pitch, before the treatment, we expect a slight lowering of pitch and increased resonance. If the patient's breathing is shallow there should be greater depth within a few minutes.

All this requires considerable practice in observation but it is necessary in order to become proficient in this new method. This is especially true when treating a patient who has abnormal ocular findings but no symptoms. Otherwise you will not know how long to treat. In any event it is always better to under treat than to over treat, and it is not only useless but actually detrimental to treat a patient 10 minutes if he responds in 4. By response is meant that there has been some change in the patient's subjective symptoms, his behavior, or appearance. In other words, whenever a definite change has been noted, either by the patient or the doctor it is sufficient for that sitting.

Other variations of the "A" classification without symptoms and having good vision would

be such complications as a low #20 finding which calls for #15 and its related frequencies on the stimulative side, some of the syndromes indicating retention which call for #23 as well as those showing tension calling for #5.

Eventually we must begin to think in terms of preventive optometry. Consequently we can not be satisfied until the ocular pattern has been restored to a harmonious relationship. Good vision and the absence of discomfort in an "A" classification with all findings satisfactory except a low #20 finding denoting a lowered response in the involuntary muscle system is sufficient evidence that a certain amount of reconditioning will be beneficial to that individual.

In the analytical routine #15 frequency would appear in the 3rd step which includes #14 and #13. To differentiate or determine which one of the three will produce the most satisfactory end results, a number of factors, such as age, sex, environment, behavior, appearance, and inherited characteristics, must be considered. Should the individual be a child under ten and somewhat underweight, we may suspect retarded glandular development. This may be due to malnutrition, over attention, shock, etc., unless the #20 finding is very low, it is well to begin with #15 and watch for improvement. In case the response is sluggish apply #13 for one or two sittings and if that does not produce the desired end results combine a small amount of minus lens power with #15. Begin with a half diopter and increase the amount in one-fourth diopter steps. If the response is then satisfactory

it is seldom necessary to go higher than two diopters. If there is some response, but very slow, try #13 combined with minus lenses and two to four diopters of prisms base in.

Children of this age who do not respond to that method are relatively rare and are usually afflicted with some physical or nervous ailment for which they are under medical care and are given some type of depressant drug or have an inherited background of poor glandular development. Those who do respond will be greatly benefited because this alteration in the ocular pattern will set in motion a train of physical activities which result in a redistribution of energy. Many cases of that kind have been handled on that basis and the results have always been very gratifying. All functions develop much better under a balanced distribution of energy and the optometrist who knows how to interpret ocular findings on this basis is the only practitioner who can recognize those tendencies. When that becomes known, and well established, preventive optometry will be the most important phase of optometric procedure.

In the age group ranging from ten to about twenty-five years the reasoning in connection with a low #20 finding is somewhat different because the emotions play a greater part during those years, and #14 frequency rather than #13 is more effective, should #15 be inadequate. If the patient has some type of ocular discomfort, however, the procedure would be more corrective than preventive. In any event if #20 is low in either this age group or those under ten or twelve, #15, #14, and #13 are the corrective frequencies. In

the next group ranging from age twenty-five to forty or forty-five, #23, and #15 are of equal importance unless there are more than two indications for #23 in the same pattern. In patients past middle age #23 becomes increasingly important and the need for #15 and its related frequencies diminishes.

Other variations in an "A" classification with good vision and no symptoms of discomfort are those which such complications as low ductions, low recoveries, low blur-out points or #11, #17, and #21 all relatively lower than #10, #16, and #20. When all ductions are low and general physical background is one of faulty metabolism, which calls for the application of #23. When any of the recoveries are low it is recorded in the 5th step of the analytical routine, which is referred to as the informative step. That in itself indicated neither a frequency, lenses, nor prisms, but must be interpreted in relation to other findings, the age, sex, etc. If all other findings are satisfactory but all recoveries are low in the first age group we conclude that all physical reserves are low, and the patient is emotionally disturbed.

If we regard the break of the duction as the quantity, and the recovery as the quality, it may be stated that in the last named syndrome the quantity is adequate, but the quality is poor. That statement applies to all age groups. If one or both of the base out duction recoveries only are low, in the age group under consideration, we assume there is some type of interference to glandular development and if that can be corroborated by other evidence, #15 and its related stimu-

lative frequencies will be of benefit. If on the other hand #11 and/or #17 recoveries are low, we suspect some type of nutritional disturbance and if additional supported evidence substantiates our assumption, #23 or its related stimulative frequencies are called for. By other evidence I mean, various indications pointing in the same direction, which may be observed in the patient's behavior and appearance or gained from the information contained in the history.

In the next age group low base out recoveries may be the result of an emotional upset, a venereal disease, or some type of obstruction as well as inflammatory processes which interfere with normal function. To determine whether or not the case is amenable to optometric means the optometrist must either refer the case for physical examination or apply a trial and error method by giving a treatment or two with #15 and then make a test of the recovery point in question. If the test shows an improvement the patient has been benefited and we may safely assume the cause is of an emotional nature. If there has been no change, #23 may be applied and, if after several visits there is still no improvement the case cannot be benefited by an optometrist.

The meaning of low base in duction recoveries is about the same in all age groups except that general physicial disorders become more complex and the individual less responsive with age. The contributing factors to the causative background of low base in duction recoveries are gastric disturbances, renal disorders, hepatic congestion, etc. When

such conditions are active the patient is very often already under the care of a physician unless it is still in the incipient stage. In either case, the application of #23 to raise the low recoveries will be very helpful.

In the event #5 is called for in the analytical routine of a case record, in this classification, without subjective symptoms, it is essential to inquire about general symptoms of nervousness, sleeplessness, and other signs of tension due to emotional disturbances or latent physical disorders for which the individual can compensate. That is, there may be low blur-out points either with prism or lens tests, showing diminished areas of tolerance. A similar background in a number of individuals may become manifest in different ways. One may show a low #9 finding; another one, low blur-outs in #16 and #17 findings; and a 3rd, in lowered #20 and #21; a 4th, by the #11, #17 and #21 being all relatively lower than #10, #16 and #20; still another one may show two or more of the various indications mentioned.

In the majority of the first two age groups previously mentioned the application of #5 frequency is very effective. In the other two age groups and especially those past middle age it is advisable to take the blood pressure because, any of those syndromes may be associated with high blood pressure and #35 will produce more satisfactory end results, at least for the first visit or two; after that #5 may be employed for a time or two until the findings are more satisfactory, but before the patient is dismissed

#35 Lowers B.P.

it is good practice to give a treatment with #2, the physiological stabilizer, about once a week for several weeks. This has a twofold purpose, first the stabilizing effect of frequency #2, which is always beneficial and second, it enables the practitioner to observe the patient over a period of several weeks before dismissal.

Case #2.

Great care must be exercised in these cases to avoid aggravating the localized irritation causing the excessive lachrymation. Frequency #23 is needed for corrective purposes but if #23 is applied immediately there may be a slight increase in the epiphora. Frequency #4 decreases the flow of secretions but it is also a sensory depressant and since the patient already complains of poor vision we do not want to lower the responses anymore than necessary to modify the symptoms already mentioned. Usually a minute or two of #4 followed by two or three minutes of #24 is sufficient to lessen the extreme watering and after two or three visits of that kind those symptoms will have subsided; then we may safely begin to use #23. Should this slightly aggravate the former symptoms we may finish the training period with a minute or two of #24.

tearing

After two or three visits it is necessary to make a visual acuity test to determine whether or not the case is amenable to further improvement. If the vision has improved, the vertical phoria tests at distance and at near should be taken and if those findings have changed toward the expected we may safely

assume that this patient will continue to respond favorably.

In fact, this particular patient did continue to improve and when he was dismissed he had about 20/30 vision and all of the findings were quite satisfactory.

Since all of the remaining case records, as they appear in Chapter 3, were taken from actual practice and I have the complete history of every one I shall give the actual outcome as well as the various physical disorders found to be associated with them.

This patient had been under treatment for chronic prostatitis and mild gastric disturbances for a number of years. After his ocular symptoms had been cared for by this method he stated that his physical symptoms had also disappeared. A case record of this kind associated with those localized ocular symptoms is hardly ever found in young individuals but similar findings with different complaints would also require the application of #23, but #4 and #24 would not be needed. Had this patient not complained of his eyes watering #23 would have been the only frequency required.

Case #3.

Since the analytical routine shows only the need for #24 and its related frequencies, the technique to alleviate the symptoms of discomfort is that of applying #45, #4, or #24, if the patient complains of those symptoms at the time of treatment. However, all of those frequencies are only palliative and

the relief obtained by that procedure is often only temporary. In any case, where the analytical routine is negative, except the 8th step calling for #24, which is palliative, the corrective frequency is always #23. This rule works both ways, that is, if a case record shows the need for #23, but there is discomfort, at the time of treatment, use #24, or one of its related frequencies, until the symptoms subside. Under such circumstances do not apply a corrective frequency at the same visit.

This patient had no symptoms of discomfort when she came in for the first training period, so #23 was employed for about four minutes. During the first minute or so, the light was flashed on and off to increase the stimulus; for the remainder of that sitting, the light was on continuously. After the treatment, the patient was instructed to wait ten minutes and then a test of the visual acuity was made which was found to be 20/20. This being on Saturday she was instructed to return on the following Monday. Another acuity was then made and found to be almost 20/15 and the patient reported that she had been free from discomfort, so frequency #2 was employed for this training period and the patient was instructed to return a week later. On the third visit the patient reported that there had been no recurrence of discomfort and the acuity was still about 20/15.

Had there been discomfort at the time of the first treatment one or more of the frequencies related to #24 would have been employed depending on the severity of the pain. As-

suming that the pain was quite intense, we would begin with #45, and as soon as the patient would report some relief we would change to #4 and if after a few minutes still more relief were reported, we would insert #2 filter with #4 making #24 and finish the treatment with that frequency. The patient would then be instructed to return the following day, or the second day, and if the discomfort had returned and were present at that time, but not as intense, we would begin with #4 for a minute or two, and finish with #24. On the other hand, if there were no discomfort at the time of the second visit the corrective frequency #23 would have been employed as previously explained. The procedure for other age groups in cases of this kind is the same, except that individuals past middle age would respond much slower.

Case #4.

Cases #1, #2, and #3 and their variations were all such that only specific light frequencies were needed because focus and triangulation being in harmony no lenses or prisms to alter the relationship between the two functions are required.

In this case the various frequencies are combined with prisms base in because of the esophoria. Although #23 is called for in the analytical routine, we do not consider it as very important in this age group. The procedure in this particular case was as follows: Due to the fact that the #17 recovery is minus, which would require two prism diopters base out during training, it was decided to begin without prisms, but employ-

ing #5 frequency only. After the first training period the #17 recovery was up to four prism diopters base-in, which was then combined with #5 for the second visit. After seven training periods with #5 and the indicated prisms base in, all findings were satisfactory, except the near phoria which was still 3 esophoria. Cases of this kind are not uncommon, and orthoptic training alone has been found to be inadequate, unless the near phoria is brought into harmony with other findings there is a tendency for the symptoms to recur.

If after the patient's symptoms have been relieved, and all findings are satisfactory, but the high esophoria at near remains; the most effect procedure I know of is that of prescribing prisms base in for near only, to be used for home treatment by having the patient read through these prisms for an hour or two each evening. If the #17 recovery is high, between twelve or fourteen prism diopters, prescribe about two-thirds to three-fourths of the recovery. If that recovery is fair, about eight to ten prism diopters, prescribe the total amount of the recovery. If the recovery is low, but the break is fairly high, about sixteen prism diopters or more, prescribe about half the break. If both the break and the recovery are low, prescribe the amount acceptable to the patient at the average reading distance, even if it is only two prism diopters. In that case, however, it must be increased from time to time as rapidly as the patient will tolerate the increase, until a total of not less than six prism diopters has been reached. Then instruct the patient to read through this com-

bination, as stated previously, with a short rest period every ten to fifteen minutes. The rest periods should be about a minute each, during which time the patient should be in a reclining position with the eyes closed; so that the relaxation takes place throughout the body.

The reasoning behind this technique is that, due to the extreme irritation, the high esophoria at near was originally a defensive activity, but later it became a habit pattern. Even though the causative factors are no longer present the habitual over-convergence at near remains. Since this habit is of an entirely localized nature, it may be reconditioned by localizing methods. Unless this is done, the disparity between focus and triangulation at near seems to be conducive to a return of the former basic disturbances. Through the eight diopters of prisms base in, the phorias at near will be sixteen esophorias but the patient being accustomed to only eight esophorias, there will be a tendency to revert to the former pattern. In most cases a week or ten days of this procedure is sufficient to break down this habit pattern.

During this time it is well to have the patient come in for training two or three times.

Within a week this particular patient showed four exophorias at near and some of the other findings, such as #11 and #17, had improved still more, the recoveries were no longer low, #19 was twelve diopters, and #5, #11, #13, and #17 were no longer low. Although #23 frequency was indicated in the analytical routine we did not have to use it because the retention of waste was very likely due to the tension which interfered with normal function. In other words, both #5 frequency and base in prisms induce expansion. This is followed by increased circulation which results in improved nutrition and the removal of waste products.

Case #5.

Plus lenses have always played an important part in these cases, because such lenses were always gratefully accepted and very often obliterated the ocular symptoms. This led to the belief that the procedure was correct, but actually any amount of plus lens power is detrimental to the general welfare of such an individual. In many of them more lens power was acceptable within a short time, so they were said to be latent hyperopes. According to that, concept nothing else could be done, and consequently these patients were very much mistreated because the method was based on false premises.

Being convinced that lenses were not needed, the reconditioning was started immediately. The patient had no discomfort at the time of treatment, so it was started with #15, for several minutes, and finished with #23 combined with prisms base in and one diopter minus spheres O. U. After four training periods of the same kind, there were no more symptoms and all findings were satisfactory. Had this patient complained of discomfort at the time of treatment #4 for a minute or two, and then #24 combined with base in would have been required. Had the near esophoria re-

mained, as it very often does, the technique as described under case #4 also applies to this one. The technique is about the same in all age groups except that the need for #23 becomes increasingly important in those past twenty-five years of age.

Case #6.

The lens prescription for this case was plano for distance with plus 1.50 add, to be used for near vision only. Since there was no discomfort, and the only frequency indicated in the analytical routine being #23, it was combined with prisms base in. The vision improved to 20/30 O.D. and 20/60 O.S. after the first application of about eight minutes. Fourteen subsequent visits cleared the vision to 20/20 O.D. and 20/30 O.S. and all findings were satisfactory. Although this patient had no ocular discomfort she had been operated for gall bladder trouble two years previously, and stated that she had not been well for many years, but since her vision had improved she felt much better.

Case #7.

As explained in Chapter 4, these cases present a real problem to the optometrist. They need the plus lenses for near vision, but could not accept them because of the high exophoria which rapidly increased with the addition of plus spheres. By this new method most of these patients are quickly made comfortable and enabled to accept the necessary plus spheres for near vision. #15 frequency is not very important and there being no discomfort, #23 combined with prisms base out

was applied and after the third visit the patient accepted the necessary reading lenses without difficulty. The #10 and #16 recoveries had changed to eight and four respectively. The phoria in the #15 finding was 14 exophorias. Six additional training periods consisting of #23 combined with prisms base out and two sittings with #2 frequency were given to complete the case.

This patient also stated that he had been treated for prostatitis several years ago but obtained very little relief. Since having his eyes reconditioned he had also obtained considerable relief from the symptoms which were due to the prostatic involvement. He was convinced that his eyes had been a contributing factor to his other difficulties, and brought in many of his friends to have their eyes examined, because of the benefit he had received.

In younger men, showing a similar ocular record, with extremely low #10 and #16 recoveries we may suspect venereal disease and if they do not respond readily it is advisable to insist on a physical examination. In women past middle age, this syndrome is indicative of an aftermath from the menopause or other pelvic disorders such as tumors or inflammatory processes as explained in Chapter 4, under Case #7. The corrective technique is the same for both sexes past middle age, but in other individuals, free from venereal disease, #15 frequency is more important.

Case #8.

These cases respond exceptionally well to

this method. This patient was given four training periods with #4 for a minute or two, followed by #24 for two or three minutes combined with prisms base out. This brought #20 and #21 findings in balance and the #10 recovery to six prism diopters. #23 frequency combined with base out was then given twice a week for three weeks at which time all findings were satisfactory. In cases of discomfort it is well to give a treatment every day, or even twice a day, until the symptoms have subsided. After that, two or three times a week is usually quite satisfactory.

Physical disorders often associated with this type of syndrome, in this sex and age group, is that of scanty menstrual flow. Because of this, considerable waste is retained and much of this is localized in the pelvic area resulting in mild inflammatory processes. When the ocular pattern has been restored to equilibrium that same harmonious activity seems to be transmitted to other parts of the body, and the patient is greatly benefited. No lenses are needed.

Case #9.

This patient had gone the rounds to a number of refractionists, both medical and optometric, and every one had prescribed lenses, and insisted that he wear them all the time. He was given two treatments with #5, combined with base out which balanced #20 and #21 findings. This was followed with four applications of #23 combined with base out which resulted in complete elimination of his symptoms and all findings were satisfactory.

About four months later he came in and stated that during the past two weeks he had noticed a slight recurrence of his former symptoms. The findings were still about the same except the #13 finding which had been down to 5 exophorias but was now eight exophorias. Two treatments with #23 combined with base out were required to obtain comfort and reduce the exophoria. No lenses were prescribed and the patient remained confortable. The procedure is about the same for all age groups.

Case #10.

To improve the vision and satisfy the patient in this classification is very simple, but to prescribe the total amount of acceptable lens power is detrimental to the general welfare and interferes with proper development of involuntary functions. A satisfactory rule is to prescribe only the amount of sphere and cylinder which actually improves vision. In this case, the prescription given was plus.50 spheres combined with plus 1.00 cylinders X 90 O.U. This gave 20/20 vision O.U. which could not be improved with more lens power. Taking the #20 and #21 findings through this lens combination made the #20 finding considerably lower than #21. To harmonize the ocular pattern it was necessary to institute some type of training which would raise the #20 finding. This new set up changes the analytical routine to #15 in the 3rd step instead of #5 in the 7th step, and since there are no symptoms of discomfort #15 and #13 frequencies may both be used in combination with minus lenses for reconditioning.

Flashing is very often necessary, and should

flashing

be done in the usual manner, by turning the light off and leaving it off twice as long as it is on. However, if the patient shows any signs of irritation, either in the form of a mild hyperemia or restlessness it is well to discontinue the flashing. In that case, the patient is already hypersensitive and will respond favorably without flashing. The technique for the actual reduction of the ametropia will be fully covered in Chapter 6.

Case #11.

Lest the reader conclude that this new approach is essentially a system of "throw away your glasses and see with your eyes", it is essential to bear in mind that the prescribing of supportive lenses will always be an important part of optometric service. All types of ocular reconditioning, including these new methods are limited to the patient's ability to readjust himself. All we can do as optometrists is to set in motion a train of psycho-physiological activities by applying changes in the pathway or composition of light before it enters the eyes. If this is done intelligently, it will be followed by a desirable alteration in functions within the limits of the response mechanism.

I have purposely selected many case records where no lenses were needed but the patient had ocular discomfort, and/or, lowered visualacuity for which we now have a remedy. Furthermore, I contend that supportive lenses, or, prisms should be prescribed only as a last resort, and then only the amount required for adequate vision. Minus spheres and prisms are already being used in that

manner, so we need only to include plus spheres and both types of cylinders as well as tinted lenses.

I realize that such a statement is contrary to the present accepted concept and I am stepping on "hallowed" optometric ground, but new discoveries have made it possible to broaden our field of service and stay entirely within the limits of our jurisdiction. Any attempt to encroach upon the rights of others would be futile, at least for a young profession like optometry, and, I would be the last to advocate it.

Since the prescribing of lenses has always been the most important phase of optometric procedure, it is well understood, and, it would be a waste of time and space in this work to dwell on that part; however, on this new basis, certain modifications are necessary and those points are being stressed because if the practitioner does not fully realize the importance of that phase, he will be disappointed with this new procedure. I suggest that the above be heavily underlined so there may be no misunderstanding as to the intent and purpose of this volume.

The prescription in this case was plus .75 spheres O.U. Through those lenses the #20 finding was only minus .75 and the #21, plus 4.25. These lenses gave the patient some immediate relief but did not balance the ocular pattern. To accomplish that, #13, #14, #15 and #23 were all applied for corrective purposes in the order named. #4 and #24 were used several times because the patient complained of frontal headaches at the

time of treatment. One of those treatments with #4 and #24 was given on the first visit. For the second training period, which was the following day, #13 was used for about two minutes and then #15 for about four minutes to finish that treatment. Two days later, on the third visit, the patient reported that he had been free from discomfort since the first treatment, so that training period consisted of #14 for about three minutes and then #15 for the remainder of that sitting. Although #23 does not appear in the analytical routine it was used because #24 appears in the eighth step, and, as previously explained, whenever #24 and its related frequencies is called for, #23 is substituted if no discomfort is present at the time of treatment, but #13, #14, and #15 are the more important frequencies in these cases. Another sedative treatment with #4 and #24 was given a week later because the patient complained of frontal headache at that time, but stated that he thought it was due to a transient digestive disturbance because he had been out late the evening before with a party of friends, eating and drinking more than the usual amount. Evidently, this was correct as he had no recurrence after that. This patient remained comfortable after the sixth training period, but fourteen additional applications were required to balance the ocular pattern. The technique for reducing the ametropia is described in Chapter 6 under Case #10. It is not advisable to make any special effort to reduce hyperopia in most individuals past thirty years of age. Occasionally, it is possible to eliminate all of the hyperopic manifestation in someone near forty years of age, but ordinarily it is

necessary to prescribe supportive lenses for most of the ametropia.

It so happens that my own ocular set-up was quite similar to this one and for nearly ten years I wore plus 2.00 spheres O.U. through which I had 20/15 vision. At the age of 38, I reduced the lenses to plus 1.50 and instituted the technique for reconditioning as outlined for this case in this chapter and that described in Chapter #6 under Case #10. I had no ocular discomfort but my main reason for becoming interested was that, unless I had good illumination there were signs of presbyopia. Being also interested in the effects of ocular reconditioning on circulation I had my blood pressure taken, which was 115 systolic, 70 diastolic, and the pulse rate was 68. During the past two years, I have not worn any lenses and the blood pressure is now 130 systolic, 80 diastolic, and the pulse rate is 74. My static refraction, or #5 finding, varies from plus .25 to plus .50. More than plus .25 blurs my distant vision. I read about as well without lenses as formerly with plus two spheres. That is, it is becoming somewhat difficult to see fine print unless the illumination is about five foot candle or better. Consequently, I do not expect to continue near work much longer without supportive lenses. By the same token, I do not advocate an attempt to eliminate presbyopia because, that condition is in harmony with natural or normal degeneration throughout the body, unless it is premature, or the amount of add required is much greater than the average for a given age. The background in such cases is primarily of an emotional nature which seems to interfere

with involuntary response and tonus.

In the first age group, this type of syndrome seems to indicate retarded glandular development. In those past middle age it is indicative of pelvic disorders.

Case #12.

Patients with this type of syndrome were almost always disappointed because of the preconceived idea that it was only necessary to find someone who could fit them with the proper lenses. When lenses did improve their vision they were well satisfied, for a short time, only to be disappointed later by being informed that very likely the condition would progress until total blindness ensued, for which an operation was the only solution.

With this new technique, ocular functions can very often be sufficiently improved to prevent further progress of the condition. Barring traumatism or some other localized interference the background in these cases is that of retention. This patient had 20/60 vision O.U. After eighteen applications of #23 frequency covering a period of six weeks, his visual acuity was 20/30 O.U. and the vertical imbalance at both distance and near had disappeared. The prescription given was plus .50 for distance and plus 1.75 add for near. This gave him practically 20/20 vision.

Case #13.

As previously stated, we do not expect to eliminate all of the ametropia in this age

group unless it is less than one diopter, but, any unnecessary plus lens power is detrimental to the general welfare of such individuals. When the #21 finding is low and the esophoria at near increases with the addition of plus, the patient will hardly ever accept the total lens power indicated in the #7 finding with comfort. But, since they are hyperopes with esophoria the average refractionist has insisted on prescribing the total amount of plus shown in the #7 finding and then told the patient "you have to get used to your glasses". Unfortunately, many of them did finally get used to them, but their ocular sypmtoms usually remained. This patient was given three training periods with #5 frequency combined with prisms base in and plus 1.00 spheres. The prescription given for constant wear was plus 1.00 spheres O.U. The plus 1.00 spheres mentioned previously, were added during the training only. This resulted in a balanced ocular pattern except the #13 finding was still 10 esophorias. She was then given eight diopters of prisms base in which were supplied with fit overs and used for reading at home, one hour each evening as described under Case 4, of this Chapter. This type of syndrome is rarely found in older individuals and the technique for those in other age groups is about the same, except that in children and young adults it is very often possible to eliminate all of the hyperopia.

Case #14.

Prescribing the total amount of lens acceptance for this type is common practise among refractionists, mainly because the patient

readily accepts it and the subjective symptoms are very often completely irradicated. Furthermore, the ocular pattern is thereby artificially restored to balance; but, the lowered involuntary muscle tonus drops still lower if the total amount accepted without blur is prescribed. Due to the chromatic interval it is desirable to maintain a certain amount of hyperopic manifestation and this can only be obtained by further lowering of the tonus. Within a year or two, these patients would return for a change of lenses because their former symptoms had returned, and, there being additional plus acceptable, it was called latent hyperopia. The causative background is emotional, so the relief should be obtained through reconditioning rather than supportive lenses. In this case, the lenses prescribed were plus .75 cylinder axis 90. Vision was 20/20 O.U. and complete relief from subjective symptoms was obtained with eight treatments over a period of two weeks. The first four were sedative, consisting of #45 for about a minute, then #4 for about six minutes which produced almost complete relief during the first sitting. The second treatment consisted of #4 and #24 frequencies only. When the patient returned for the fifth visit, she reported no discomfort, so, #15 and #23 combined with base in were then given. When both #15 and #23 are called for in a case with an emotional background, it is well to use #15 first and finish the treatment with a minute or two of #23 At the end of two weeks all of the findings except the near phorias were quite satisfactory so the base in prism method for home treatment was used. After only four evenings of reading through the base in prisms for

about an hour each evening, the near phorias were also in harmony with other findings and the patient was dismissed for one month. When she returned a month later, she reported that she had been entirely free from discomfort until the last few days. Several tests were then made, such as the phorias, the #16 and #20 findings. Both the #16 recovery and the #20 finding had dropped some, so it was decided to continue training. Three five minute periods, two days apart, were given which resulted in restoration of satisfactory findings and complete relief from symptoms. This lasted for nearly six months at which time the patient again returned with some recurrence of the former symptoms. This time only one training period of about three minutes was required to obtain satisfactory end results. There has been no recurrence of the symptoms and in addition to that, the patient reported relief from several physical symptoms for which she had formerly required periodic treatments, the most pronounced of which was dysmenorrhea.

Case #15.

There are few mothers who do not dread the thought of putting glasses on a child of this age. But, in the past, there was nothing much that we could do with these cases aside from prescribing lenses for constant wear. Although in this case the left eye calls for a one diopter cylinder at an oblique axis, and, according to the presently accepted concept, such eyes should by all means, have supportive lenses. Perhaps one of the main reasons for insisting on that procedure is the fact that we had nothing else to offer.

If we want to be absolutely honest about it, we must admit that there are thousands of individuals who do have from one-fourth to one diopter of astigmatism in one eye, or both, but have good vision and no discomfort. So, we cannot point to the ametropia as the sole cause for the lowered visual acuity. When we look at the analytical routine and note that all ductions are low, all recoveries are low, and the #20 finding is very low, the cause for the amblyopia is obvious.

The Mother of this patient was extremely anxious to have something done for her child so he would not need to wear glasses. None were prescribed, and the reconditioning was started immediately. After six training periods with #13 for about two minutes, and three minutes with #23, the patient had 20/20 O.D. and 20/30 O.S. All recoveries were up, #20 was in fair ratio with #21 and #7 finding showed plus 1.50, and the left eye required only -.75 cylinder.

Case #16.

Although the analytical routine indicates #15 and its related frequencies combined with base out, if there are no symptoms of discomfort, any of the red-orange-yellow bands may be employed. It is well to prescribe slightly less plus than the amount needed for clearest vision.

This particular patient required plus 2.00 spheres O.U. to obtain 20/15 vision, which was the same as that obtained through the #7 finding. Plus 1.50 spheres O.U. gave 20/20 vision, through which the patient had four

prism diopters of exophoria at distance and twelve at near.

This left her with an extremely low #20 finding and relatively high exophoria at both distance and near. This patient was somewhat pale and underweight, as well as slow and listless in all her actions. Also her breathing was shallow, so it was decided that #13 frequency was very definitely indicated. Since #13 is the extreme of both #15 and #23 the technique was that of beginning with #13 for about a minute, combined with prisms base out, then #15 for a minute or two, and two or three minutes of #23 combined with base out to finish the first training period; four such treatments were given, one each day for four days. The visual acuity through the plus 1.50 spheres was then 20/15 O.U., the phoria at distance was one prism diopter of exophoria, and eight at near. The #20 finding through those lenses was then minus 3.00 and the #21 was plus 3.00. The patient then had good vision and a well balanced ocular pattern. If further reduction of the ametropia is desired the case may be continued as described in Chapter Six.

The technique is about the same for all age groups except that, the possibility of reducing the ametropia decreases with age.

Case #17.

Due to the fact that the exophoria at near is in excess of the dynamic retinoscope finding, supportive lenses are not the solution for this patient. In fact, they are definitely contra-indicated. This is another type that

has been very much mistreated ocularly by former means, because they readily accepted plus lens power without interfering with their visual acuity at distance.

The eight analytical steps show very plainly what is behind this disturbed ocular pattern. The only frequency called for is #23, and because of the relatively high exophoria, this band of light is combined with prisms base out to alter function in the desired direction. In addition to the minimum routine findings and the eight analytical steps, the subjective symptoms and constricted color fields also point very definitely to retention of waste products interfering with localized functional activities.

This particular patient was given eighteen training periods of #23 combined with prisms base out over a period of six weeks. The first four were given at intervals of one each day, then three a week for several weeks, and the remainder at the rate of two each week, resulting in relief from all symptoms, normal color fields, and a well balanced ocular pattern. No lenses were prescribed.

Case #18.

Although the analytical routine calls for #15 in the third step, that particular band and its related frequencies is not very important in a patient of this age and sex, and need be employed only as a last resort. In fact, those frequencies are definitely contra-indicated as long as the subjective symptoms are present. With that in mind, only #24

and its related bands remain in the analytical routine. Those frequencies being primarily palliative, we do not expect much improvement in the ocular pattern by their use. We do however expect immediate relief from the subjective symptoms and if that does not occur at the first sitting, we have fairly reliable assurance that those symptoms are entirely due to retention of waste products in the local tissues, and consequently, would institute training with #23 combined with prisms base out. Immediate relief from subjective symptoms is not intended to mean complete elimination from those symptoms at the first sitting but, a decided modification. It may require a number of sittings with palliative frequencies before the corrective frequency #23 is employed. In this particular case the training was started with #45 for about a minute, then changed to #4 for about two minutes and finished with #24 for about three minutes. Three additional periods of the same kind were given, one each day. By that time the symptoms had subsided materially but, four additional palliative training periods were given, beginning with #4 for a minute or two and completing with two to four minutes of #24. This was followed by training with #23 combined with prisms base out three times a week for two weeks, at which time the patient was entirely free from symptoms, the vision was again normal, but some of the findings were not yet satisfactory, so the training was continued once a week for eight weeks.

At the end of that series of training periods, the findings were also quite satisfactory such as #15 was then 14 prism diopters

of exophoria, #16 finding was X/12/6. Through supportive lenses of plus .50 spheres for distance and plus 2.50 added for near, which were then prescribed, his visual acuity for distance was 20/20 minus O.U., and his #20 finding was minus .50 and #21, plus .75.

Case #19.

Whenever the entire analytical routine is negative in this classification, the procedure to be followed is fully covered in Chapter Six under case #19.

Case #20.

As stated in Chapter Three under this classification and syndrome, we do not expect to reduce the myopia in a patient of this age, and to obtain comfort is relatively easy. Depending of course on the patient's general health and ability to readjust himself. The analytical routine calls for #23 four times. This clearly shows the causative background to be that of retention. Being a business executive, having those ocular and physical symptoms combined with all recoveries low and vertical imbalance at both distance and near, points to over-eating, especially of rich foods, and lask of physical activity.

This particular patient was decidedly overweight but was already under the care of his physician for that phase and it only remained for the optometrist to care for him ocularly.

The patient had never worn lenses and he was perfectly satisfied with his vision, so none were prescribed at the time training was

started. The Optometric treatments consisted entirely of #23 frequency. Twenty-two treatments were given over a period of two months which resulted in relief from all symptoms, improved distance vision from 20/40 O.U. to 20/30 plus, O.U., and satisfactory ocular findings. However the change in his ocular pattern made it necessary to prescribe plus 1.00 spheres O.U. for reading. With the aid of his physician's advice, he reduced fifteen pounds of his former weight. Needless to say he was well pleased with the outcome of his case, and referred many patients to the optometrist who cared for him by this method.

In younger patients of this type and syndrome the technique described in Chapter Six under Case #19 is employed to complete the training if necessary.

Case #21.

The technique for this type is about the same as that for Case #20 except that there is no discomfort, and it is merely a matter of improving the visual acuity. This patient had forty-two treatments with #23 over a period of four months, resulting in satisfactory findings with an acuity of 20/30 O.U. at distance, and she was given plus 1.00 spheres O.U. for reading.

Case #22.

Here we have a patient for whom much can be done, on this new basis. The technique is almost entirely that described under classification H, in Chapter Six, except the

preparation for that technique, consisting of #15 and its related frequencies combined with base in, to bring #20 finding in balance with #21, improve the #10 and #16 recoveries, and bring the near phoria into harmony with the distance. The last named complication is cared for by the base in prisms method at near, for home training, as described in Chapter Five, under case #4, paragraph 3. The technique for this particular patient preparatory to that explained in Chapter Six was that of training with #15 and its related frequencies, combined with prisms base in. After three training periods of that kind #20 and #21 findings were in balance, #10 and #16 recoveries were up, #8 finding was one esophoria, #13 was orthophoria. Ten prism diopters base in were prescribed for home treatment to bring the near phoria into harmony with the distance. The patient was instructed to read one hour each evening through the prisms. At the end of one week the distance phoria was orthophoria, and the #13 finding was four exophoria. The training was then continued as described in Chapter Six.

Case #23.

To arrest the progress in myopia is no longer a problem in this classification and age group. If the general physical background is very poor and the response mechanism is very sluggish, the actual reduction or elimination of myopia is doubtful. However, a certain amount of reduction almost always accompanies the technique employed to arrest the condition and balancing of the ocular pattern. In this particular case the final

outcome was entirely satisfactory but, had there been a greater amount of myopic projection, it is doubtful that the same satisfactory end results would have been obtained. The technique employed in this case was that, of beginning with #4 for about two minutes and about four minutes of #24 combined with prisms base in. This was done because the patient complained of discomfort at the time of treatment, which was entirely eliminated during the first sitting. This happened to be on Friday afternoon immediately after school, so he was instructed to return the next morning for the second visit, at which time he was free from symptoms, so the training consisted of #15 for about 2 minutes and then #23 for about three minutes, both combined with prisms base in. Four such training periods were given during the following week and at that time tests revealed that the #10 and #16 recoveries were up to the expected; the #20 finding was minus 3.50 and #21 was plus 2.00. Therefore the ocular setup then indicated #5 and its related frequencies because #11, #17, #21 findings were all relatively lower than #10, #16, and #20. In addition to those frequencies combined with prisms base in for training, the base in prism technique for home treatments was prescribed, which resulted in 20/15 vision O.U., no discomfort, a balanced ocular pattern, and the #7 finding was plus .25 O.U. Had this case shown a #7 finding of minus one or more, the continuation would have been that described in Chapter Six, case #19, and classification H.

Case #24.

If the pathology is active in this type it is not a case for an Optometrist except, to prescribe the indicated lens power. In this particular patient however, the condition was no longer active, and very gratifying results were obtained by the technique employed, which was that of training with #5 combined with prisms base out for several minutes. After three training periods, one each day, for three successive days, the indication for #5 was no longer present, so #23 combined with prisms base in was then used. Twenty-six training periods of that kind, over a period of two months resulted in 20/30 vision, through minus .50 spheres, and a well balanced ocular pattern. The patient had 20/40 vision without lenses and desired to go without, so none were prescribed.

Case #25.

Except for the esophoria this is another case where all of the analytical routine steps are negative, and the technique to be followed is described in Chapter Six, under classification H, and case #25.

Case #26.

In this case a number of complications must be considered and cared for, to prepare it for the technique described in Chapter Six. In this particular case the technique was that of beginning with #45 frequency, then #4, and #24, all combined with prisms base out. After two training periods of that kind the symptoms of discomfort had been decidedly

modified and training was continued by beginning with #4 and completing the treatment with #24, combined with prisms base out. After five such training periods the frequency was changed to #23. After eight visits all symptoms had been eliminated and the ocular pattern was in balance.

The reconditioning was then continued as described in Chapter Six, under classification I, and case #25.

Case #27.

The technique in this case is the same as that for case #21 except that, frequency #23 is combined with prisms base out instead of base in. The final outcome was 20/20 vision O.U., and a balanced ocular pattern. Plus one spheres were prescribed for reading.

Case #28, #29, #30.

The technique for these cases is covered in Chapter Six, under Antimetropia, and Anisometropia.

In Closing this chapter, I wish to point out that, nearly all of the technique is based on practical experience and clinical observation. No claim is made for absolute perfection, nor is it intended to be the ultimate. Much of this material may require modification and many elaborations, as well as refinements in the years to come. It is intended only as a beginning in a new direction as a new foundation upon which to erect the future Optometric edifice in compliance with a new impending social structure.

CHAPTER SIX

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This is mainly a continuation of the technique described in Chapter Five adding a new method of prescribing special lenses and /or prisms for the purpose of further reducing existing Ametropias and heterophorias.

Chapter Six

REDUCING AMETROPIAS AND HETEROPHORIAS

Since cases #1, #2 and #3 are emmetropic and orthophoric, they require no consideration in this chapter. Only those cases which require further reconditioning than that described in Chapter 5 will receive attention in the present chapter: because these cases are without discomfort and have normal vision, the various complications having been eliminated before this phase is started.

After the patient has been made ocularly comfortable with or without lenses for constant wear, it is often desirable and sometimes beneficial to reduce the amount of manifest ametropia and/or heterophoria. Desirable, because the patient may resent the constant wearing of lenses, and beneficial because, if the ametropia and/or heterophoria are primarily ocular manifestations of psychophysiological disturbances, the reduction of the manifestations will be transmitted to other parts of the body resulting in a more harmonious coordination.

Since hyperopia and myopia are opposites, the technique for their reduction must also be in opposite directions. This procedure is based on the premise that hyperopia is an ocular manifestation of lowered involuntary muscle tonus, or posture; whereas, myopia is a form of hyper-tonicity in the same system. The reflex action of the voluntary system, as expressed by the phorias and ductions is largely dependent on the existing metabolism

in that musculature and the sensitivity of its response mechanism, as it may be affected by focus activity.

EMMETROPIA WITH ESOPHORIA
Classification B

Should the focus setup be satisfactory when the case is started or the emmetropia has been brought about through reconditioning, but a certain amount of esophoria is still present, the following procedure is very effective. Assuming that all other findings are satisfactory and the relationship between the distance and near phoria is harmonious; that is, if there are 4 to 6 prism diopters less esophoria at near than at distance, prescribe two prism diopters base in for constant wear and institute training with the indicated frequencies combined with the proper amount of prisms base in during training. For example: all findings are satisfactory but the patient shows six prism diopters of esophoria at distance and two of esophoria at near. If then two prism diopters base in are prescribed and the phorias are taken through the prisms, the tests will show 8 prism diopters of esophoria at distance and 4 at near but, the patient being accustomed to six at distance and two at near, will readily revert to the former phoria through the prisms for constant wear. When the patient again exhibits the same esophoria, or less, through the prisms as formerly without, two more prism diopters base in may be added and the training continued as before. This procedure of adding prisms base in for constant wear, when the patient has reverted to the former phoria through the prisms, is continued until the esophoria through the prisms is equal to the amount of prisms base in. If that is 6 of esophoria through six base in, it is actually orthophoria without prisms but, if all of the prisms were then removed, the orthophoric condition would not remain because, the patient is accustomed to six of esophoria, so we remove only two prism diopters, which will give us four of esophoria at distance through the remaining prisms.

With that in place, we continue training with the indicated frequencies combined with prisms base in, to hold the esophoria down to four prism diopters. When that has been accomplished, remove two more diopters of base in prisms. The test will now show two of esophoria at distance, so we continue training as before, in an effort to hold the new postural position. If we succeed, the remaining prisms are removed and the patient will show orthophoria, and additional training is required to establish this as a relatively permanent part of the pattern.

In all techniques, for the purpose of producing postural changes, it is well to give occasional rest periods of one or two weeks because, such postural changes are transmitted to all parts of the body and, therefore, cannot be done hurriedly. Furthermore, the process is partly that of establishing new habits, which must also be done slowly, if any degree of permanency is to be expected.

Case #4 - Specific Technique

After the technique described in Chapter 5 under Case #4 was completed, there remained

two prism diopters of esophoria at distance. Ordinarily, such small amounts of esophoria are of little or no consequence, but, in cases of this kind it is well to produce orthophoria, or even a small amount of exophoria, lest they revert to their former ocular habits.

To accomplish this, prescribe two diopters of plano base in prisms and continue training with the predominant frequencies formerly used, combined with prisms base in.

Since the patient has two of esophoria without prisms, a test through the prisms will show four of esophoria but, the patient being accustomed to two prism diopters of esophoria, will revert to the accustomed pattern, inasmuch as, she is also being treated with prisms base in. When the test again shows two of esophoria through four prism diopters base in, the patient actually has two of exophoria without prisms. If we now remove two diopters of the base in prisms, the patient will have orthophoria through the remaining prisms.

Our effort is now directed toward maintaining that posture, which is done by continuation of the previous training. When this has been accomplished, remove the remaining prisms, give a few more treatments and the case is finished.

It may be stated that when the last two diopters of prisms are removed, the patient may show one or two prism diopters of exophoria but there is usually a slight reversion to the former posture, so a small amount

of exophoria at the completion of a case with esophoria tendencies is desirable.

EMMETROPIA WITH EXOPHORIA
Classification C

The technique in this classification differs from that of classification B, mainly in prism placement, during the training, as well as those prescribed for constant wear. The predominating frequencies are usually #13, #3 and #23.

Case #7 - Specific Technique

It is not often that exophoria requires special attention in addition to the reconditioning described in Chapter 5. Very likely the main reason is that the natural tendency of extrinsic muscel< posture is inward and, therefore, a decrease in exophoria usually accompanies the application of red-yellow-orange frequencies combined with base out prism training.

However, when additional training to reduce the exophoria is required, the prescribing of prisms base out for home treatment similar to the base in prism treatment described under Case #4 in Chapter 5, is very effective; especially if the exophoria at near is relatively much greater than at distance.

In case the distance and near phorias are in fair ratio, the prescribing of prisms base out for constant wear must be resorted to. This is done on a similar basis as prisms base in for esophoria, except that the prisms are placed with their bases outward, and very

often a small amount of plus spheres must be incorporated to prevent a possible reflex stimulation to focus, especially in children and young adults.

HYPEROPIA WITH ORTHOPHORIA
Classification D

The red-orange-yellow frequencies are all indicated for reducing hyperopia unless the analytical routine points to a definite background of either retarded glandular development - some type of reproductive (emotional) disturbance or faulty metabolism - which has been explained in previous chapters.

In this classification, care must be exercised to guard against reflex stimulation to triangulation, so it is well to combine the frequencies with prisms base in for training, and, if necessary, prescribe a small amount for constant wear. Otherwise, the technique described under Case #10, applies to all cases in this classification.

Case #10 - Specific Technique

At the completion of the technique described in Chapter 5, the prescription given was plus 1.00 spheres combined with plus 1.50 cylinder, axis 90, which gave 20/20 vision O.U. The patient was given a rest period of one month, and when the training was resumed the lenses were changed to plus .50 spheres combined with plus 1.00 cylinder, axis 90; this gave 20/40 vision.

The training consisted of #13, #14, #15, #3 and #23 frequencies, employing two of them at each sitting. Beginning with #13 for about two minutes (flashing) then #15 for about three minutes to finish that treatment. The next visit consisted of #3 for about two minutes, which was also flashed, and then about three minutes of #23. For the third visit, the routine of the first treatment was repeated; and, for the fourth sitting, the treatment was started with #14 and finished with #15. Six treatments on that basis produced 20/20 vision.

Then the lenses were changed to plus .50 cylinders, axis 90, which again gave 20/40 vision. The training was continued as before, but ten training periods were required to obtain 20/20 vision. The patient was then given another thirty-day rest period, after which the remaining .50 diopter cylinders were removed and she had 20/30 vision without lenses. Four treatments brought the vision to 20/20.

The #5 finding was then plus 1.00 spheres combined with plus 1.25 cylinder, axis 90. The ophthalmometer showed a corresponding change in the corneal curve. Six months later, during which time no treatments had been given, the #5 finding was plus 1.25 sphere combined with plus .50 cylinder, axis 90. This coincided with the change in corneal curve shown by the ophthalmometer. The patient had 20/15 vision, a balanced ocular pattern and no discomfort. In addition to that, there was good stereopsis, and a decided increase in reading rate and comprehension. It will be noted that the vision was the same through the number 7 finding as that through the first prescription given.

HYPEROPIA WITH ESOPHORIA
Classification E

Assuming that we are dealing with a case of hyperopia with esophoria, the patient is a male, age seven, the ocular pattern is in a relative state of balance with plus 2.00 diopter spheres but, without such lenses, there are two prism diopters esophoria at distance and two of exophoria at near, the number 20 and 21 findings being minus 2.50 and plus 2.50, respectively, through the supportive lenses, the number 20 finding would be minus .50 and number 21 plus 4.50 without lenses. Such an imbalance is very apt to cause considerable localized discomfort, but the supportive lenses merely neutralize the condition, establishing an artificial balance instead of correcting it.

This obliterates the ocular symptoms and often increases visual efficiency; but, the imbalance in other functions of the body, related to the eyes directly or indirectly, remain about the same. I am well aware of the fact that a certain amount of support at the point of least resistance or greatest stress may produce an apparent general improvement, but to depend on such support indefinitely is rarely the proper solution.

However, if we regard hyperopia as an anatomical defect, such supportive lenses to be worn permanently would be quite correct. That such as assumption is questionable was brought out in Chapter 1, and, in this work we regard hyperopia primarily as malfunction rather than anatomical. Therefore, we attempt to alter function as much as possible

toward the expected, and then prescribe supportive lenses if they are still needed for adequate vision.

Going back to the hypothetical 2.00 diopter hyperope with a balanced ocular pattern through the plus 2.00 diopter spheres, we would reduce the lenses to plus 1.50 spheres and then institute training to balance the pattern. During that process the number 20 finding is used as the guide. If the number 20 and 21 findings are taken through these reduced plus lenses, number 20 will be -2.00 and number 21 plus 3.00. Any training intended to raise number 20, requires frequencies on the red-orange-yellow end of the spectrum, such as #13, #14, #15, #3 and #23 and also, minus lenses; but the reduced plus already constitutes the addition of minus, so it is hardly ever necessary to add more minus during the training. Futhermore, it is advisable to always stay well within the areas of tolerance in order to avoid the violation of conditioned reflexes. That is the reason why I insist that the amount of prisms base in, out, up or down, used for reconditioning, should never be more than that shown by the recovery point at the distance of the target. By the same token the amount of minus or plus lenses must be kept well within the area of clear vision.

Any stimulus that induces contraction in the focus mechanism may also reflexly cause a similar activity in the triangulation, especially, in cases with orthophoria or esophoria, so it is well to incorporate the proper amount of base in prisms during the training. With the filters producing #13

frequency combined with the indicated lenses and prisms, direct the patient's attention to a well illuminated target and turn the light on and off, or have a flasher arrangement with the "off" period about twice as long as it is "on". Continue this for two to four minutes depending somewhat upon the response of the individual;-that is, if the patient responds quickly, which may be determined by observing the general behavior in various activities such as walking, moving from one position to another, the reaction time in answering questions, the speed of speech, etc. Then change to #15 or #23, depending upon which one of the two is the most important, as shown in the eight routine analytical steps. Should that be #23, begin the next training period with #3 and finish with #23. For the third visit repeat the technique as applied during the first sitting. The majority of cases in this category, however, will require #14 and #15 in addition to #13; whereas, #13, #3 and #23 are called for in the majority of hyperopes with exophoria.

Therefore, in most cases of this kind, alternate with #13 and #15 combined with the indicated lens and prism combination for one treatment and #14 and #15 in combination with the same lenses and prisms for the second treatment, and, during the third visit repeat the technique as applied in the first treatment, etc. Continue this until #20 and #21 are in ratio and then reduce the lens prescription for constant wear to plus 1.00 diopter spheres and treat as before.

As soon as the pattern is again in balance,

reduce the lenses for constant wear another half diopter, continuing with the same treatments, and so on until there is a balanced ocular pattern without lenses. In most cases the hyperopia will be a half to one diopter less and, if it is a whole diopter less, there will be only one diopter left; and for a patient under ten, that is quite satisfactory.

On the other hand, if the same amount of hyperopia or more than one diopter is still manifest, it will be necessary to prescribe minus .50 spheres for constant wear, which will again create an imbalance in the pattern and require further training. If this is still insufficient to produce the desired end results, another half diopter of minus sphere must be added to the lenses for constant wear, making a total of minus 1.00. In case this increases the esophoria, it is necessary to incorporate prisms base in. Usually, two prism diopter (one for each eye) is sufficient. It is well to give a rest period of ten days to two weeks between changes of lenses for constant wear.

During this process of reconditioning the following signs will aid the practitioner to determine whether or not the patient is amenable to further reduction and whether the changes are being made too rapidly for the individual under treatment. First, note the change in number 20. If it goes up rapidly, the patient is very apt to respond favorably; if that response is slow, considerable time is usually required to obtain any appreciable amount of reduction. If no change takes place in that finding, the case is not amen-

able to further reduction. Second, if the patient becomes irritable or develops a mild hyperemia, either the treatments are too frequent, or changes in lenses for constant wear are being made too rapidly, or both.

Occasionally, a case may not respond at one time, but several months later the response is good. Such instances have been reported a number of times during the past two years by various practitioners throughout the country, who are employing this technique. We do not know why this is, but very likely the general physical setup prevented alterations in posture during the first attempt and certain changes took place favoring further alterations, such as a change in environment and general physical improvement. At any rate, the old adage, "if you do not succeed the first time, try, try again" may well apply to this work.

Case #13 - Specific Technique

Although it is not advisable to reduce all of the hyperopia in patients of this age, this particular individual was very desirous of eliminating the need for lenses and, by the routine described above, after forty-two visits covering a period of six months, the number 5 finding was plus 1.00 and the number 7 finding plus .75. She had 20/20 vision without lenses, number 19 finding still showed 6 diopters, she had no discomfort and a balanced ocular pattern.

HYPEROPIA WITH EXOPHORIA
Classification F

The procedure for hyperopes with exophoria, relative to frequencies and lenses, is about the same except, as previously stated, the important frequencies are more often #3 and #23 in addition to #13, instead of #13, #14 and #15. Also, the prism placement is base out unless the exophoria is only a small amount, in which case, no prisms are needed. The differentiating factors are usually indicated in the routine analytical steps.

Case #16 - Specific Technique

The reduction of hyperopia and exophoria, existing simultaneously, is relatively simple by this method in a child of this age. Since #15 appears in the routine analytical steps, #13, #14 and #15 are the proper frequencies and are combined with prisms base out during training. Prescribe the amount of plus spheres, if any are needed, which gives about 20/30 or 20/40 vision; then treat with the indicated frequency and prism combination until the vision is 20/20, then reduce the plus in half diopter steps and continue training as before. If the vision is 20/20 without lenses, it is necessary to prescribe minus lenses for constant wear. This is also done in half diopter steps, and either improvement in vision, balancing of number 20 and 21, or both, are used as guides for lens changes.

MYOPIA WITH ORTHOPHORIA
Classification G

Our primary aim in the beginning of this

technique, is to increase triangulation, or convergence to equal focus in ratio of 5-1. That is, five prism diopters of esophoria to one diopter of myopia. This must be done without reflex stimulation to focus. In other words, we must increase the esophoria without reflexly increasing the myopia.

The reasoning behind this principle is that it is easier to induce contraction than expansion, so stimulate convergence and inhibit focus in myopia with orthophoria, whereas, in hyperopia with orthophoria, as mentioned previously, we stimulate focus and inhibit convergence.

Case #19 - Specific Technique

Since the acceptance of plus .50 spheres, without blurring distant vision, is considered as emmetropia, and the number 7 finding in this case shows the need for minus .50 spheres to obtain 20/20 vision, it is regarded as one diopter of myopia. This, being an over-focus of one diopter at distance, we strive to produce an over-convergence, or esophoria, of five to six prism diopters, without reflexly increasing the myopia. To accomplish this, prescribe two diopters of prisms base out for constant wear. This patient being orthophoric at distance without prisms, would show two of exophoria through the base out prisms; but, being accustomed to orthophoria, will readily change posture and revert to orthophoria through the prisms. To aid in this readjustment base out treatments combined with frequencies on the blue-indigo-violet end of the spectrum, consisting of #45, #5, #35, #4 and #24, are given.

It is well to use two different frequencies during one training period, beginning with a more extreme for a minute or two, then two or three minutes with a more moderate frequency. If no complications arise in the course of the procedure, the following variations are quite satisfactory; - for the first visit begin with #45 and finish with #4; for the next period begin with #5 and finish with #35; for the third visit begin with #45 and finish with #35; and, for the fourth treatment begin with #5 and finish with #24.

For subsequent training, repeat the above outline. Those frequencies are referred to as inhibitive, or sedative frequencies, and are employed in the process of reducing myopia, primarily to inhibit focus. Therefore, whenever the statement is made in succeeding pages, "employ inhibitive or sedative frequencies", it means the variation described in the preceding paragraph.

When the patient again shows orthophoria, add two diopters of prisms base out, which will again produce two of exophoria. Then continue with the training consisting of sedative frequencies combined with prisms base out until the patient reverts to orthophoria, at which time, two more diopters of prisms are added. The same treatments are then applied until there is orthophoria at distance through six diopters of prisms base out, which actually means six of esophoria without prisms. During this process, no minus lenses are prescribed, so the patient has had a small amount of natural inhibition to focus, in addition to the inhibitive frequencies.

With six diopters of plano prism base out before the eyes of the patient having orthophoria through the prisms, we are ready to reduce the base out prisms, the effect of which, is that of base in. When two diopters have been removed, a test immediately afterward would show two of esophoria at distance. Then treat with prisms base in combined with inhibitive frequencies. This induces inhibition to both triangulation and focus and when the patient has reverted to orthophoria, a small amount of myopia will also have been eliminated. Usually the amount of reduction is about .25 to .50 with two prism diopters of postural change in triangulation from esophoria to orthophoria. In this particular case, after the first reduction of prisms base in and two training periods, the test showed an acuity of 20/20 with orthophoria at distance through the remaining four diopters of prisms base out. A further reduction of two diopters of prisms was then made and the treatments continued; but since there was no longer a natural inhibition to focus, plus .50 spheres were incorporated with the remaining two diopters of base in prisms. After four training periods, a test was made and the visual acuity was then 20/30, orthophoria at distance through that lens and prism combination, so the remaining base out prisms were removed, leaving only the plus .50 spheres in place. Training was then continued which was sedative frequencies with prisms base in.

At this point, it may be stated that training must always be in harmony with the prism placement for constant wear; that is, during the process of increasing prisms base out for

constant wear, the training is also done through prisms base out with sedative frequencies, whereas, when the base out prism reduction is started, the treatment prisms are changed to base in, because, the effect of reducing base out for constant wear is as though prisms base in were being prescribed.

Going back to the specific technique for this patient, we have reached the point where the patient has 20/30 vision through plus .50 spheres and with that, two of esophoria for distance. The training was then continued and after eight training periods the vision was 20/20 through the lenses and the distance test showed one of exophoria; so the lenses were removed, leaving the patient with orthophoria and 20/15 vision.

Not every patient responds as this one did. Very often it is necessary to repeat the entire procedure because, only a small amount of the myopia was eliminated during the first series of changes from plano to six diopters of base out prisms and back to plano, in two diopter steps. Occasionally, we encounter a case of this kind where no reduction of the myopia follows, even after repeating the procedure several times. Several years ago, we believed such cases were hopeless from the standpoint of reducing the myopia; however, as stated previously, during the past two years a number of instances have been reported by those who apply this technique where a patient would not respond at one time, but several months later, the myopia yielded readily to this technique. Therefore, it is not well to dismiss a young patient as not being amenable to reduction

of myopia if the response is unsatisfactory during the first attempt. Try several times during the year, if necessary, at intervals of three to four months. In cases with two diopters of myopia or more, it is not possible to produce sufficient esophoria to equal focus in one series of prism changes because, it would require more than ten prism diopters base out, which becimes somewhat cumbersome. Fortunately, it has been found that ten prism diopters is sufficient for one series of changes from plano to ten base out and back to plano. Consequently, a patient with three diopters of myopia would require several such series of changes and each time during one series in the procedure, from .25 to one diopter of myopia is eliminated. However, if the patient has been wearing the total amount of minus lenses needed for clear vision, it is necessary to reduce the lenses for constant wear, one diopter, or more, before the prism changes are started, to insure a certain amount of inhibition of focus during the reduction process. It happens very often that, after base out prisms have been prescribed for constant wear, a patient who was formerly orthophoric will not only revert to orthophoric but, actually develop some esophoric. For example:- The patient has orthophoria without prisms and two diopters of plano base out prisms are prescribed, through which the individual shows two of exophoria. He is then given a base out treatment or two and when a test is made, it shows four of esophoria through the two diopters of base out prisms. This actually means six of esophoria, so if there is only one diopter of myopia, the two reflexes, triangulation and focus are in harmonious

relationship and no more prism base out need be added; but, instead, the training may then be reversed to base in, with sedative frequencies, to reduce the esophoria, and simultaneously with that, the myopia. This training may then be continued until the esophoria has been eliminated and with that, the myopia is very often also reduced.

During this procedure, tests must be made occasionally and, as soon as the vision is clear, the minus lenses, if any are worn, must be reduced or plus lenses prescribed if no minus lenses were worn. Assuming that a case which was formerly orthophoric and showed four of esophoria after the first two diopters of prisms base out have been prescribed, is a myope of one diopter or less, and has never worn lenses, we would prescribe plus .50 spheres as soon as the vision has cleared to 20/20. Then remove the prisms and continue training until the vision is 20/20 through the plus .50 spheres.

In cases of two diopters or more of myopia, if the patient has been wearing the total amount of indicated lens power, reduce the lenses at least one diopter. Then begin the base out prism technique in two diopter steps up to ten base out. During that time treat with sedative frequencies and prisms base out. After the total amount of ten diopters base out has been reached, begin to reduce them in two diopter steps and also treat with sedative frequencies and prisms base in.

When all the prisms have been removed give the patient a rest period of two or three weeks. Assuming that the patient has been a

the Basic Technique

myope of three diopters and one diopter has been eliminated during the first series of prism changes he is handled like a new patient with two diopters of myopia, after the rest period; that is, the original three diopters were reduced to two diopters and are now reduced to one, during the second series of prism changes. Should only a half diopter of myopia be eliminated during the first series, it is advisable to reduce the lenses an additional half diopter for the second series. Example:- The patient was wearing minus 3.00 through which he had 20/20 vision; the lenses were reduced to minus 2.00 through which he had 20/80 vision. After the first series his vision is 20/40 through the minus 2.00 lenses; but minus 2.50 gives 20/20 vision. Then, reduce the lenses to minus 1.50 at the beginning of the second series of prism changes.

MYOPIA WITH ESOPHORIA
Classification H

Granting that the symptoms have been eliminated and the ocular pattern balanced by the technique explained in Chapter 5, it remains to reduce both the myopia and the esophoria.

If the amount of myopia is relatively much greater than the esophoria, the technique outlined under Case #19 will be equally effective in this type; but, if the esophoria is equal to the focus in ratio of 5-1, or nearly so, no base out prisms are needed. In such cases it is well to do as much as possible with treatments alone, consisting of sedative frequencies combined with base in. When no further reduction is possible

in that manner, prescribe prisms base in for constant wera.

Considering a myope of two diopters with ten of esophoria at distance, who has been given twelve treatments with the result that he now shows one diopter of myopia with five of esophoria and no further reduction is possible with treatments alone, we would prescribe two diopters of prism base in for constant wear. Through those prisms he would show seven of esophoria; but, having previously been reduced to five, he would readily revert to that posture with continued base in and sedative frequency training. With that change of posture and triangulation, there follows a postural change in focus, resulting in further reduction of the myopia. Then more prisms base in are added and the training continued until the vision is 20/20 at distance, at which time plus .50 spheres are incorporated and the training continued until the visual acuity is about 20/20 through the prevailing lens and prism combination. Now, remove two diopters of prism base in and the patient will show three of esophoria; so, continue the same training in an effort to maintain this new posture in triangulation. If it remains after two or three days with training periods once or twice daily, remove two more diopters of the base in prisms. The patient will now show one of esophoria. If a total of six diopters of prism base in were needed originally to eliminate the myopia and the patient is now wearing plus .50 spheres with two base in, which gives 20/20 vision and one of esophoria at distance, remove the remaining prisms and finish the case in the same manner as described under Case #19.

In cases where the esophoria is relatively much higher than the myopia, the prescribing of plano prisms base in for constant wear in combination with base in and sedative frequencies training is very effective. Example:- A given patient has 20/20 vision through minus .25 spheres, he is eighteen years of age, has never worn lenses, but was ocularly uncomfortable which has been cared for and he is now desirous of obtaining clear vision without lenses. Through the minus .25 spheres giving him 20/20 vision, he shows four of esophoria at distance and orthophoria at near, with all other findings satisfactory. Prescribe two diopters of plano base in prisms, through which he will show six of esophoria; but, being accustomed to four of esophoria, with the aid of sedative frequencies and base in training, he will readily revert to four of esophoria and with that postural change in triangulation, the vision will clear sufficiently to give him 20/20 through the plano prisms; then add two diopters base in and continue the training, which will further inhibit triangulation, followed by reflex inhibition of focus. He now has four of esophoria through four prism diopters base in and 20/20 vision through plus .50 spheres added to the prisms. However, it is not necessary to prescribe the plus spheres for constant wear in cases where the esophoria is relatively higher than the myopia. Therefore, it is only necessary to reduce the base in prisms and maintain the resulting change in triangulation posture so there will be orthophoria when all of the prisms have been removed.

Case #22 - Specific Technique

Please bear in mind that the actual myopia is about a half diopter more than the amount shown in the number 7 finding. Consequently, this case is a two diopter amyope with two prism diopters of esophoria at distance and four at near without lenses. She has had glasses but could not wear them so none were prescribed. After the technique described in Chapter 5 was completed, two diopters of plano prism base out were prescribed for constant wear through which she showed orthophoria at distance immediately after they were applied. She was then given a treatment with sedative frequencies and base out and when she came for the second training period, the following day, a test was made and she showed six of esophoria at distance through the two diopters of base out prism. The training was then changed to base in with sedative frequencies and after eight training periods she had 20/20 vision through the prisms and four of esophoria at distance, so the prisms were removed and six additional training periods with base in and the same inhibitive frequencies gave her 20/20 vision and orthophoria at distance through plus .50 spheres. Without lenses her vision was 20/15 and orthophoria to one of esophoria at distance.

MYOPIA WITH EXOPHORIA
Classification I

In classification G and H, we do not expect any reduction of the myopia during the process of increasing base out prisms, but in myopia with exophoria, there is very often a

decided reduction during that phase of the procedure. The more difficult part of the technique in this classification is that of maintaining orthophoria at the completion of the reconditioning process. With that in mind it is well to produce several prism diopters more esophoria than that required in other classifications, especially if the exophoria is relatively high. Aside from the above remarks the routine technique is very similar to that described under classification G, in case #19.

Case #25 - Specific Technique

Two diopters of plano base out prisms were prescribed for this patient, followed by a five minute training period of sedative frequencies combined with prisms base out. The following day when she came for the second treatment, tests were made which showed orthophoria at distance and she had 20/20 vision through minus 1.25 spheres. Two diopters of prisms base out were then added and the treatments continued twice daily. After the fourth visit she had 20/20 vision through minus .75 spheres and showed four prism diopters of esophoria at distance through the four diopters of prisms base out she was wearing, then two more diopters of prisms base out were added and training continued. When she came for the third treatment in this series, she still had 20/20 vision through minus .75 sphere combined with six diopters of prism base out and, had four of esophoria through that lens and prism combination. The treatments were then changed to base in, with the same frequency, and after eight sittings, she had 20/20 vision and orthophoria at distance through four diopters of plano prisms base out.

The remaining four diopters of base out prisms were then reduced to two, and the patient was given a two weeks rest period. When she returned, her vision was 20/15 and she had orthophoria at distance through the prisms she was wearing, which were then removed. A complete examination was made, and all findings were satisfactory. All cases do not respond as readily to this technique as this one, but, it must be kept in mind that the principles are always the same throughout the entire procedure. However, the technique differs according to the classifications and syndrome in relation to the patient's age, sex, and environment. The last statement applies to all phases in the practice of modern Optometry.

ANTIMETROPIA

When there is a difference in refraction of one diopter or more, between the two eyes in these types, supportive lenses are usually indispensable and, unless the difference is very great, the lenses indicated in the number 7 finding are almost always gratefully accepted.

In the relatively rare cases where the difference between the two eyes is more than four diopters, one guess for a solution is about as good as another. In other words, trial and error may solve the problem, but it is always advisable to institute reconditioning and continue as long as the case responds favorably, before prescribing lenses for constant wear.

Chapter Seven

STRABISMUS

The New Concept

This subject has been so well covered in a number of volumes by outstanding authorities during the past decade, that I shall confine myself to the various phases which differ materially because of the new concept advanced in previous chapters of this work. Aside from surgery, the various writers were merely concerned with the refraction and the development of fusion and stereopsis.

In harmony with other phases of this new approach, we regard a tropia primarily as an exaggerated phoria; and, also the result of basic psycho - physiological disturbances, either inherited, acquired, or a combination of both. Therefore, the approach to a case of hyperopia with esotropia is similar to that of hyperopia with esophoria. To clarify, we may consider a relatively common case of convergent strabismus with hyperopia. The patient is a male, age eight, whose left eye began turning in occasionally at the age of eighteen months. At the age of two years, the condition was quite firmly established and has remained about the same until the present examination, which showed about 30 prism diopters of esotropia and 3 diopters of manifest hyperopia. The vision was 20/20 O.D. and 20/80 O.S. without lenses. All versions good and all other externals negative. The ophthalmoscope finding was also negative and he had normal retinal corres-

pondence. The commonly accepted theory in this type of case is that one eye turns in because the patient, being a hyperope, must overcome a supposed optical defect by means of ciliary contraction, allowing the crystalline lens to increase convexity. That, due to the inter-relationship between focus and triangulation there is a reflex stimulation to the internal recti muscles which results in an over-convergence. The image of the turning eye is then suppressed to prevent diplopia. Other factors which have been said to be causes of squint, are anisometropia, antimetropia, abnormal retinal correspondence, or, anything that interferes with fusion development. It would seem that those conditions should be classed as only contributing factors because there are too many individuals who manifest such anomalies but have straight eyes and, very often they are not even aware of being thus afflicted until they have their eyes examined.

It is true that very often a deviating eye in this type will tend to straighten when plus lenses are applied, and very likely that phenomenon led to the belief that the uncorrected hyperopia was the cause of the strabismus.

On the basis of this new concept, it is believed that the esotropia in this type is the result of lowered involuntary tonus which became manifest in the eye because that happened to be the point of least resistance in that particular individual. Consequently, the technique is first directed toward increasing that tonicity, which is accomplished with the red-orange-yellow frequencies and minus lenses, or reduced plus.

The technique in this case was as follows: The patient had 20/15 vision O.D. and 20/40 O.S. through plus 3.00 spheres O.U. It was the same through plus 1.00 spheres O.U; that is, one diopter spheres were needed to give the best possible vision with lenses and the addition of plus 2.00 diopter spheres was accepted without blur at distance, but was not needed for adequate vision.

The first prescription given was plus .50 spheres O.U. This reduced the vision to 20/30 O.D. and 20/60 O.S. Four treatments with #15 for the right eye and #13 for the left eye brought the vision to 20/15 O.D. and 20/30 O.S. through the plus .50 spheres. During the training periods, the right eye was occluded for ten to twenty seconds several times during the treatment and the light was flashed for the left eye during that time. This was done because of the amblyopia. Then, the plus .50 spheres were removed and the naked visual acuity was 20/20 O.D. and 20/40 O.S. The training was continued as before and, after five daily visits the vision was 20/15 O.D. and 20/20 O.S. By this time, the number 7 finding, or hyperopic manifestation had been reduced to two diopters. Minus .50 spheres were then prescribed, O.U., and the training continued by alternating with the various red-orange-yellow frequencies, as described in Chapter 6, under Case #13. These minus lenses reduced the vision slightly, but, after three daily training periods, the vision was again 20/15 O.D. and 20/30 O.S. The patient was then given a two weeks rest period. Then, another half diopter of minus sphere was added O.U. This, again reduced the vision slightly, but four daily

treatments restored it to the former level. A rest period of one week was then given and another half diopter of minus sphere added. This procedure was continued until a total of four diopters of minus sphere O.U. had been reached. Then, the patient was given a thirty-day rest period. During all rest periods the patient was instructed to constantly wear the lenses prescribed. The term "rest period" pertains only to treatments; however, it is well to have the patient report once or twice a week for observation because, as stated in a previous chapter, if the patient becomes irritable or develops a mild hyperemia, the treatments and/or the changes or lenses have been too frequent. After a thirty-day rest period the number 7 finding was minus 1.00 sphere O.U. In other words, the patient was then a one diopter myope. The minus 4.00 diopter lenses being worn were then reduced to minus 3.50 and treatments were changed to sedative frequencies. After three visits, the esotropia had reduced to about 25 prism diopters. These three treatments were given over a period of one week. The lenses were then reduced to minus 3.00 and the same treatments continued. After four sittings, the esotropia had reduced to 20 prism diopters. A two weeks rest period was then given. After that, the lenses were reduced to minus 2.50 and the treatments continued.

This series of treatments was given through a stereoscopic arrangement which made fusion possible. At this point, it may be stated that so long as the attention is directed toward basic disturbances, no special effort to develop fusion is made except that when

the patient has progressed to the point where fusion is possible, the treatments must be given through a stereoscopic arrangement. In this particular case, no other attention was given to fusion development other than that mentioned. After fusion was quite well developed the case was continued as one of myopia with esophoria as described in Chapter 6 under case #22. The minus lenses for constant wear were reduced in half diopter steps twice each week and training continued with sedative frequencies, combined with prisms base in. One treatment was given after each lens change.

When all lenses had been removed, a complete examination was made and the findings were as follows:

#3 = 5 eso	#13 = 8 eso
#4 = 10 eso	#14 = plus 2.00
#5 = plus 1.00	#15 = 4 eso
#6 = plus 2.00	#16 = x/30 plus/30
#7 = plus .50	#17 = x/8/0
#8 = 5 eso	#18 = neg.
#9 = X	#19 = 10D
#10 = 30 plus/30	#20 = -2.00
#11 = 2/-6	#21 = plus 3.00
#12 = neg.	

The case was then continued as one of hyperopia with esophoria described in Chapter 6 under Case #13.

If the total amount of acceptable plus lens power has been worn for any length of time in cases of this kind and by the wearing of such lenses the esotropia had been reduced materially, it usually reverts to the former

position during the process of plus reduction and the prescribing of minus lenses. This must be explained to the patient or the parents, in case it is a young child, so they will not become alarmed about it. If they respond to this technique, the esotropia will reduce with the reduction of minus lenses. For example: If a case had been an esotrope of about 40 prism diopters with 4 diopters of hyperopia and by the wearing of plus 4.00 spheres combined with prevailing treatments for convergent squint, the esotropia had been reduced to about 20 prism diopters, it will go back to the original 40 prism diopters when this new technique is applied. However, this takes place during the first phase because the very first step in this method is to reduce the plus to the point where it begins to lower the patient's visual acuity.

Assuming that, due to former training, the vision is 20/20 with the good eye and 20/50 with the deviating eye through plus 4.00 spheres and it were possible to reduce the lenses to plus 1.50 spheres without affecting the vision, the first prescription would be plus 1.00 spheres. Then, training would be started with the frequencies mentioned earlier in this chapter for the purpose of raising involuntary tonus and improving vision. When vision is as good through plus 1.00 spheres as formerly through plus 1.50, the lenses are reduced to plus .50 and training continued as previously described. By the time all plus lens power has been removed, the esotropia will again be 40 prism diopters; but, it hardly ever increases any more than the former amount. Then minus lenses are prescribed and increased in half diopter steps

combined with the indicated training in the manner previously described. After the entire series of lens changes up to minus 3.00 or 4.00 and back to plano has been completed, and no change in triangulation posture has taken place, the case is not amenable to basic improvement by this method and the prevailing techniques of fusion development, base in prism training in connection with various devices, flasher techniques, the prescribing of prisms with their bases in various positions, or any other variation that may be effective in such cases, must then be resorted to.

In cases that are amenable to this method we are not dependent on fusion, so the technique is ideal for alternating squinters even if they have abnormal or anomalous retinal correspondence because the postural change in triangulation is brought about reflexly through alterations in the focus mechanism. The fact that there are many individuals with straight eyes who do not have fusion due to the amblyopia in one eye, or other causes, making fusion impossible, is sufficient proof that fusion is not absolutely essential to maintain ocular parallelism.

Should a case straighten only partly during one series of lens changes it is advisable to give a rest period of about thirty days and repeat the procedure. Sometimes only 8 or 10 prism diopters of reduction takes place during one series of lens changes combined with the indicated treatments, and during the second series a gain of only 5 prism diopters maybe made. Such cases usually have poor physical background and respond slowly,

so the process must be repeated a number of times, at intervals of about one to three months. At any rate, those who do respond to this method require decidedly less lens power and often none, after the eyes are straight. In addition to that, there is almost always a decided general improvement physically and mentally, as well as their general behavior and attitude to their surroundings.

Another type that responds very well to this procedure is that of hyperopia with exotropia. They usually straighten quickly, develop good fusion and stereopsis but maintain parallelism only under conscious effort. These cases were very disappointing when cared for by former methods because of the fact that they readily accepted the plus lenses indicated in the number 7 finding, and responded well to any type of training with base out prisms to the point where they would fuse with 80 to 100 prism diopters base out; showing that they had ample convergence reserve but unless they made a conscious effort, the deviating eye would revert to its former outward position.

By this new technique they also respond well, and their eyes usually remain straight when the process has been completed. The technique is very similar to that in hyperopia with exophoria, as described in Chapter 6 under Case #16, except that in the beginning no base out prisms are prescribed for constant wear; that is, we apply various flasher techniques combined with the indicated frequencies through a stereoscopic arrangement which makes fusion possible and then gradually

reduce the amount of prisms base in, employed during the training. After the patient begins to fuse there is usually a rapid reduction in the exotropia and when the eyes are straight, we are ready for the technique described in Chapter 6 under Case #16.

The technique for emmetropia with esotropia is similar to that of convergent squint with hyperopia, that is, begin with the prescribing of minus spheres for constant wear, and employ the indicated frequencies for training. If the patient is a young child under ten years of age, it is permissible to prescribe minus 1.00 spheres as the first pair of lenses for constant wear, then increase the minus lens power in half diopter steps, according to the response of the individual.

The total amount of minus lens power finally prescribed before reduction, depends on the response of the individual and the amount of deviation from parallelism. Example: the patient is a female, age 9, is emmetropic, has 20/15 vision O.U., and thirty-five prism diopters of esotropia. Prescribe minus 1.00 spheres O.U., and treat with the indicated frequencies. Before training, minus 2.00 spheres reduced the vision to 20/30 O.U., but only one diopter of minus spheres is being prescribed. This does not affect the vision, so the amount of minus lens power which reduces the vision to about 20/30 is used as a guide for increasing the minus lens power to be worn constantly. If after several treatments, the patient will tolerate minus 2.50 spheres before the vision is blurred to 20/30 the lenses for constant wear are increased to minus 1.50, and so on, until a total of

minus 5.00 diopters is reached; then the patient is given a rest period of about thirty days wearing those lenses. After that, the lenses are reduced in half diopter steps once or twice a week, depending on the response of the individual; during this process of reducing the minus lenses together with sedative frequencies, we expect a gradual reduction of the esotropia. If that takes place, treat through some type of stereoscopic arrangement, with a target that is easily fused, and insert prisms which makes fusion possible, but do not urge the patient to fuse. Instead, ask the patient what he sees, and if the stereoscopic targets contain the proper control marks, the patient's answers to your questions will enable you to determine whether there is fusion and stereopsis. When fusion and stereopsis are fairly well developed, the case may be completed as one of myopia with esophoria, as described in Chapter 6 under case #22; and any other variations of technique which may be helpful in connection with this procedure.

In cases of emmetropia with exotropia, this technique is also very effective. However, the patient may rapidly develop myopia, ranging from three to ten diopters during the first few weeks of training with red-orange-yellow frequencies through the stereoscopic arrangement which enables the patient to fuse. This increase in myopia usually takes place during that phase of the training, when the exotropia is being reduced; that is, after fusion has been developed, the myopia developed during the postural change from exotropia to parallelism. It is necessary to prescribe the amount of minus lens power

needed for clear vision, and to maintain parallelism. Such lenses are worn with perfect comfort; and after they have been worn a month or two, a new pattern of harmonious binocular coordination will have been established. A new examination and analysis can then be made and the case handled according to the new setup. A number of such cases have been reported and in all except one, the myopia was later completely eliminated and the eyes remained straight.

In the one exception, the eyes remained straight, but the case had developed 10 diopters of myopia during the process of straightening, and only four diopters of the myopia were eliminated afterwards. This patient had no fusion and every attempt to develop it failed. Nothing special was done to reduce the myopia because the patient had no fusion, and there was no known technique to reduce myopia in cases of that kind. This particular individual was a young married woman, age 21. At the time of treatments for the exotropia, she was emmetropic and had 20/20 vision with either eye; but when she had learned to straighten her eyes, she had 10 diopters of myopia when the eyes were parallel. She could voluntarily straighten them or permit one eye to deviate outward to its former position. Whenever one eye deviated outward, she had 20/20 vision with the straight eye, but when she straightened them, 10 diopters of minus lens power was required to obtain that same visual acuity. Also, with minus 10 diopter spheres in place she was unable to let one eye deviate, so the minus 10 diopter spheres were prescribed for constant wear, with which she had straight

eyes and perfect comfort. As stated previously, she was unable to fuse and there being no known technique to reduce myopia in cases of that kind, nothing was done about it. A few months later the patient reported some ocular discomfort; a test revealed that only nine diopters of minus spheres were needed to obtain 20/20 vision, which was then prescribed. About six months later, a similar complaint brought the patient back for re-examination. At this time only eight diopters of minus lens power was required to give 20/20 vision. This same reduction continued until only six diopters remained. When the patient last reported, no further reduction of the myopia had taken place and she was still wearing minus 6.00 diopter spheres O.U., with good vision, straight eyes and perfect comfort.

CHAPTER EIGHT

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General elaborations covering a variety of refinements of technique in the more uncommon cases encountered; and additional reasoning on interpretation of symptoms from an extra-optometric standpoint.

Chapter Eight

GENERAL ELABORATIONS

Unfortunately, it has been common practice in all professions dealing with the human body, or parts of it, to think in terms of specific remedies for various manifestations according to the name given to a particular manifestation, which very often meant nothing more than a certain location. One group or school of healing will prescribe a variety of remedies for inflammatory processes having a common cause, but may manifest in different parts of the body. On the other hand, an inflammatory process in a certain part of the body such as tonsilitis, in several different individuals may have a different cause in each one.

To a great extent Optometrists have fallen heir to that same, erroneous reasoning; so we often hear such questions asked as, "What can you do for exophoria, esophoria, amblyopia, photophobia, etc; etc;?" Instead, the question should be, "Why does a given patient have any of those symptoms?" For example: an amblyopia may be caused by various toxins; exogenous or endogenous. It may be due to non-use, or hysteria. With such a variety of possible causative backgrounds, it certainly must be fallacious to treat all of them alike. Therefore, in all phases of this new method, our approach is always based on the causative factors in relation to a given individual. In other words, the principals are always the same but the technique varies in accordance with the findings and subjec-

tive symptoms in relation to the patient's age, sex, environment, etc.

AMBLYOPIA

Lowered visual acuity which cannot be improved by changing the pathway of light alone, is a common experience in optometric practice. The mere flashing of light, irrespective of the kind, or even to employ red light for all cases of amblyopia, is relatively crude. It is true that in many cases, vision can be improved by such haphazard guess work, but, that should not be regarded as scientific optometry.

Due to the fact that it is often difficult to make a sufficient number of tests in amblyopic cases to obtain adequate information from the ocular pattern and subjective symptoms alone, it is well to be familiar with some of the objective physical signs that are usually associated with certain ocular syndromes. As stated in a previous chapter, "a rule must work both ways". If certain objective physical signs are often associated with certain ocular syndromes, we may employ such signs for information in the absence of sufficient ocular tests. In cases of moderate amblyopia, existing only in one eye, in which it is possible to make the required tests for a relatively complete analysis, we interpert the findings in the usual manner and institute training accordingly. A sufficient number of such cases have been recorded and the various physical signs previously referred to have been tabulated, so when we do encounter a case where all of the necessary ocular findings cannot be made, we

are still in position to administer a fairly reliable technique. However, it is always advisable to utilize the ocular findings, few as they may be, to reason from and employ the various objective physical signs only as corroborative evidence. For example: A case presents itself, the patient is a female, age 16. The only findings that can be made aside from the ophthalmoscope and ophthalmometer are the various retinoscope tests and the phorias. The vision is 20/20 O.D. and 20/300 O.S. The distance phoria is approximately 8 esophoria, the near phoria about 4 of esophoria, the static retinoscope finding shows plus 2.00 spheres O.U. and the dynamic retinoscope finding at 20 inches shows plus 3.00 spheres O.U. A patient of this age and sex with such findings, usually falls into the category of emotional disturbances and if in connection with that, there are various physical signs of emotional upset, such as nervousness, irritability, appearance of tenseness, easily noticed around the mouth, rapid pulse, irregular breathing, and there is additional corroborative evidence in the form of subjective symptoms such as inability to sleep, fearful dreams, usually the kind where the patient experiences sensations of falling from a great height, and frequent crying spells, we are reasonably safe in assuming that #15, the emotional stabilizer, will be the most effective frequency. This may be followed by a trial and error method of employing first #15 for two or three minutes, occluding the right eye for several ten to twenty second periods and flashing the light for the left eye during those periods. Then try #2 frequency, the physiological stabilizer, in a

similar manner. A test is made after each trial to determine which one of the two produced the greater amount of improvement in vision. If the effect of both is about equal, it is well to alternate with #15 and #23, either during the same treatment or employing #15 for one sitting and #23 for the next visit. Should #2 produce a much greater improvement than #15, the case is very likely one of what is commonly referred to as toxic amblyopia and #23 is the proper frequency to use until the vision is satisfactory, or there is no further improvement.

Assuming that, the vision has been improved in the left eye from 20/300 to 20/100 with #15 and #23 but no further improvement is possible with those frequencies, it is then advisable to try #13 for that eye only, by occluding the good eye. After the doctor has had a certain amount of experience in handling a variety of amblyopias on this basis, the trial and error method is hardly ever necessary. Even if only a few findings can be made, he will readily observe sufficient objective symptons to establish a fairly complete syndrome pointing in a certain direction sufficiently accurate to begin treatment.

Occasionally, a case of amblyopia is encountered where there is considerable hyper-tension which interferes with circulation and may result in localized anemia or faulty nutrition in that area. In such cases it is necessary to apply one of the sedative frequencies that induce expansion, such as #5. This expansion removes the former interference and is followed by increased

circulation and improved nutrition. In the majority of such cases there will be rapid improvement in vision as long as the tension is the main obstacle and then, one of the red-orange-yellow frequencies must be employed for further correction. This is just one example to show that the flashing of a red light is not always the proper method in treating amblyopia and, sometimes even detrimental.

PHOTOPHOBIA

According to the reasoning and clinical experience by those who have applied this method, photophobia also has been very much misunderstood in the past. Barring transient conditions and special occupations where the individual works under unusually intense light, I am convinced that a tinted lens for constant wear to relieve photophobia is wrong. It is another form of support upon which the nervous system will readily learn to depend. In my own practice not a single tinted lens has been prescribed for that purpose for more than five years; and, during that time many cases of extreme photophobia were cared for who obtained perfect comfort without the constant wearing of tinted lenses. During the past three years, the same procedure has been applied by hundreds of well known optometrists who now agree with my conclusions. To merely give relief from photophobia is incomplete. Palliative treatment must be followed by corrective measures according to the syndrome in relation to the individual. The main objective in giving relief from those symptoms is that of lowering sensitivity. Number 4 frequency being

the sensory depressant, plays an important part in that phase of the technique. It depends upon the severity of the symptoms as to whether #4 is used alone or whether #5 is added to intensify the depressant action; and in case a modification is desired #2 filter is combined with #4 which is then #24.

To obtain quick relief in a case of extreme photophobia accompanied by excessive lachrymation, begin with #45. If necessary, dim the light slightly by shading it or partially covering it, and gradually increase the intensity; because #45 being an extreme depressant will rapidly lower the sensitivity of the response mechanism, thereby raising the patient's tolerance to more intense light. When the patient is able to tolerate the full intensity with #45, remove the #5 filters and continue with #4 by slightly subduing the light for a few seconds and gradually increasing the intensity as before. Usually those two frequencies are sufficient for one sitting. The same procedure may have to be repeated several times until the patient is sufficiently relieved to permit modifications of treatment. For subsequent treatments begin with #4 and finish with #24. After the patient is relatively free from the symptoms, give one or two sittings by beginning with #24 and completing the treatment with #2. Then enter the corrective phase according to the analysis, to obtain relative permanency.

Because of the hyper-sensitivity of the nervous system in photophobic individuals, it is well to be somewhat familiar with the relationship of structure and response. Angularity in structure very often goes hand in hand

with hyper-sensitivity. That is, an individual who is somewhat under weight or normally slender, will require more treatments of the extreme sedative frequencies than an individual of the opposite type.

At this point it may be stated that the technique for the relief of various forms of asthenopia is about the same as that for photophobia: except in those cases where the discomfort is due to toxic interference. Even then it is well to give a treatment or two with sedative frequencies first. Some of the physical signs that may be used as corroborative evidence to determine a specific frequency in a given case where the causative background points to faulty metabolism are: dryness of the skin, a bluish appearance, especially of the lips, which indicates sub-oxidation; a yellowish waxy appearance, etc. etc.

To clarify the foregoing remarks in this chapter and enable the practitioner to utilize that information by practical application, I submit the following cases from actual practice: Patient, male, age 24, complains of poor vision with left eye, N.V.A. 20/20 O.D. 20/400 O.S. Old rx O.D. plus 2.00 spheres, O.S. plus 4.00 spheres.

#1. Ophthalmoscope - Neg.
#2. Ophthalmometer - 43.00 x 180 - 43.00
#3. Distance phoria - 6 Eso.
#4. Near phoria - Ortho.
#5. Static retinoscope
0.D. plus 2.00 sph.
0.S. plus 4.00 sph.
#6. Dynamic retinoscope - at 20"
0.D. plus 3.00 sph.
0.S. plus 5.00 sph.
#7. Subjective refraction at distance.
0.D. plus 2.00 sph.
0.S. plus 4.00 sph.
#8. Induced phoria at distance
4 Eso.
#13. Induced phoria at near - Ortho.

No other tests of the routine examination were taken at this time. Color fields, negative, no fusion; visual acuity through number 7, 0.D. 20/20, 0.S. 20/300. Physical examination revealed no organic pathology. The classification is E-b. Complications in ocular pattern; findings incomplete. The patient stated that he had been troubled with digestive disturbances since childhood but not enough to warrant special attention. The poor vision in the left eye was first noticed wher he started school at the age of six. He had whooping cough at the age of three and measles when he was five years of age. He was somewhat under weight, his response in the form of answers to questions was fair, but his speech bordered on stuttering. His complexion was somewhat waxy and the lips slightly bluish, indicating sub-oxidation. His movements were somewhat jerky but slow, as though he were fatigued. The conclusion

drawn as to the cause of the amblyopia was that of faulty metabolism, dating back to childhood, resulting in glandular dysfunction. Accordingly, he should respond about equally well to #15 and #2 frequencies. This was verified when both of those frequencies were applied for about three minutes each. No change in lenses was made at that time. The training consisted of #2 frequency for the right eye, and for the left eye the treatment was started with #15 and finished with about two minutes of #23, with several intervals of flashing. The treatments were given through a stereoscopic arrangement. After fourteen sittings over a period of three weeks, the vision through the lenses he was wearing was 20/15 0.D. and 20/40 0.D. The lenses were then changed to 0.D. plus 1.00, 0.S. plus 2.00. The training was then continued with #15 for the right eye and #13 for the left eye, combined with prisms base in. After eight visits with this technique, his vision through the lenses he was then wearing was 0.D. 20/15, 0.S. 20/20. Fusion and stereopsis had been well developed during the last eight training periods and a complete examination was then made. The findings were as follows:

#3. 2 Eso.
#4. 2 Exo.
#5. 0.D. plus 1.50, 0.S. plus 2.50
#6. 0.D. plus 2.25, 0.S. plus 2.00
#7. 0.D. plus 1.25, 0.S. plus 2.00

Balance of findings were made with lenses he was then wearing.

#8. 2.00 Eso.
#9. X
#10. 18/4
#11. 6/1
#12. Neg.
#13. 2 exo.
#14. O.D. plus 2.00, O.S. plus 3.00
#15. 4 exo.
#16. x/16/4
#17. x/12/2
#18. Neg.
#19. 6D
#20. -1.50
#21. plus 2.50

Analysis:	#1.	23x2	#5.	Pos.x2R. x 2N.
	#2.	B.I.	#6.	#23
	#3.	#15	#7.	Neg.
	#4.	Neg.	#8.	Neg.

Although the visual acuity is now nearly normal, the ocular pattern still indicates the need for further reconditioning, and verifies our former contention that the causative background is one of faulty metabolism, resulting in poor glandular development. The process of reconditioning was then continued by alternating with all of the red-orange-yellow frequencies, combined with prisms base in. The lenses for constant wear were reduced to O.D. plus .50 and O.S. plus 1.00 through which the vision was 20/20 O.D. and 20/30 O.S. After four training periods the vision was again 20/15 O.D. and 20/20 O.S. and the patient reported that he had no more digestive disturbances, that his appetite was

much better than it had been, and that he had gained several pounds in weight. The prescription was then changed to two diopter of prisms base in, for constant wear, and the training continued by beginning with #15 for several minutes, and #23 to finish the treatment, combined with prisms base in. After the the fourth visit -.50 spheres O.U. were incorporated with the prisms base in for constant wear and treatments given twice each week for a period of three weeks. The patient being desirous of eliminating the need for lenses, he was given a thirty-day rest period. After that, the lenses for constant wear were increased to -1.00 spheres O.U., combined with the two diopter of prisms base in, and training continued as before. Twelve training periods were given over a period of thirty days and another examination made which revealed a balanced ocular pattern, the number 7 finding with O.D. plus .75 and O.S. plus 1.25. The patient having gained twelve pounds during the past two months was then of normal weight for the first time in years. His vision was 20/15 O.D. and 20/20 O.S. without lenses.

The following case is a female, age 26; Complains of extreme photophobia and excessive lachrymation, eyes smart and burn. Says she has hay fever. Came in wearing number 3 shade absorbtive lenses. Her eyes were so sensitive that no test could be made at that time, due to the epiphora. This patient was also somewhat under weight and, of course, her symptoms are ample proof that she was hyper-sensitive to light. A treatment of #45 followed by #4, as described earlier in this chapter, gave her sufficient relief to

I close with the hope that this volume may serve as an aid to elevate the profession of Optometry to the highest possible level of ethical professionalism, and arouse the individual optometrist to a conscious realization that optometry must begin to establish its own facts and prove to other professions as well as to the public at large, that the Optometrist can render a service which is not being duplicated by others.