

Symptomatology of Binocular Stress

*Raymond R. Roy, O.D.
Portland, Oregon*

In the past 12 months Americans have spent in excess of \$100,000,000 on pills known as tranquilizers. Such names as Miltown, Equanil, Atarax, Frenquel, Thorazine, and many others are today fast becoming a by-word on the American scene. During this same period, well over \$85,000,000 was spent for drugstore medications and remedies to relieve headache. Aspirin alone accounted for over 18 tons of the analgesics.

Yet, of these millions who are turning to tranquilizers and analgesics for relief of tension and headache, there are countless thousands who could find that relief if the proper investigations were made into the possible existence of binocular stress. In a very recent issue of a Chicago newspaper, there appeared an account of a 31-year-old police captain who committed suicide because of chronic headaches. This is not an isolated experience, because I have personally contacted several people who have attempted suicide or seriously contemplated it due to the same reason.

Yet headache is only one symptom of binocular stress. It is emphasized only because it is perhaps the most common, and because in numerous instances it is the reason for seeking optometric services. There are many other symptoms which may, in some cases, be even more annoying to the individual than the headache itself. This would especially be true of the person who rarely experiences a headache. These people are free of head pain regardless of their physical condition. Many have confessed they could not describe a headache for they have never experienced the sensation. Within this group, binocular stress will manifest itself with other symptoms and it is important to the ophthalmic practitioner to know and look for these.

Psychological Factors

There has been considerable recognition given to the importance of psychological factors in visual symptomatology, and this must be included in any discussion pertaining to symptoms.

Since symptoms are subjective, they do not exist by themselves; but they are meaningful expressions of some underlying disorder. They are the signals sent to the conscious mind that some fault exists somewhere in the organism. They are a protective mechanism to the in-

dividual, yet sometimes their meaning is distorted giving rise to anxieties which may, in turn, produce more symptoms leading to a vicious cycle.

In cases where there is no clear demarcation between symptoms arising from physiological factors and those arising from psychological factors, the apathetic approach would be to



*Raymond R. Roy, O.D.
headache is only one symptom*

classify all as psychological and not conduct an exhaustive search for a physiological basis. Bridgeman² has given us an excellent caution relative to the psychological factors of visual symptomatology. It is true they must be kept in mind, but today the diagnostic pendulum has reached a point at which it is much simpler to classify all symptoms not having a demonstrable organic basis as psychological.

Hirsch,³ in writing of this medical attitude toward emotional trauma says, "But this does not give us license to stamp as psychosomatic any distress for which we have no ready diagnosis. In my mind, if a patient has definite need for the help of a psychiatrist, he is not well (even though the *well* might be enclosed with quotation marks). And as for the "well" patient who feels sick, I do not assume to disentangle mental and physical, but rather to treat them together, as they occur in the body."

Lancaster,¹² in 1942, referred to the indirect effect of treatment procedures as psychotherapy. He admitted to the indirect effects of therapy in all health practices, but that practitioners were derelict in their duty if they did not capitalize on these effects.

Bannon,¹ in reviewing the problem, classified symptoms as visual, ocular, and referred. He cautioned that many of the referred symptoms may not be from an ocular condition.

Michaels,¹⁴ in his excellent series on "Optometric Diagnosis," has much to say about the importance of visual symptomatology. He also emphasizes the fact that it is a tragic thing to label a given phenomenon as "psychologic" without a most thorough and exhaustive search. He says that such a label defines a problem, it does not offer a solution, and he further states, "It is deplorable that the term has become a pigeon-hole into which one can conveniently dump everything that is not understood. What is worse, it has become a cliché used to seduce the unsuspecting into believing that something is understood or being explained when, in fact, it is just given another name."

Thus, we see a new trend in the writings on symptomatology and diagnosis in which the authors deplore the hasty diagnosis of "psychological" to those problems for which no demonstrable physiological or anatomical deviation has been localized. Also deplored is the labeling as "psychosomatic" any therapy which may remove seemingly isolated or unrelated phenomenon along with the specific problem under treatment. This is indeed an encouraging note.

Perhaps one of the most revolutionary medical concepts to come to light in modern research is the work on stress by Hans Selye.²³ In his recent book he unveils the result of years of painstaking research on the subject of stress and the fascinating experiments done to corroborate these theories. In this work he has shown that every conceivable agent has both specific and non-specific actions.

Every individual, or part of an individual, can be influenced non-specifically as well as specifically, and any given therapy will have non-specific as well as specific results. Thus, we now have new evidence that the alleviation of referred symptoms or non-specific symptoms by any specific therapy has not always been in the realm of the psychosomatic, but in the realm of a complex neural and endocrine network of body control. It is my firm belief that within the next decade we shall be able to look back at this present "psychosomatic" era through eyes which, having been enlightened by new research and new appreciations of the complexities of the human organism, will be much better endowed to truly delineate physiological and psychological problems. With a greater

appreciation for interprofessional and intra-professional cooperation, the individual specialists will be able to cooperatively better diagnose than the individual practitioner today. This will require a professional "United Nations," wherein individual professions and specialists will meet jointly to learn something of each other's field. In this way, a certain syndrome which may be considered psychological by one specialist, is found by another specialist to be physiological, yet the first practitioner must appreciate this fact for intelligent referral.

Let it be said that there is a tremendous need for research into the psychological problems of man. There are the neuroses and the mild psychoses, which can be the etiological factors in many symptoms which may take the patient to an optometric office; but there are also many symptoms of chronic binocular stress which are sending people for psychiatric treatment. When a certain syndrome can be common to two different specialties, it behooves men in each group to understand the other.

Structural vs. Functional

We must recognize that symptoms are an outward manifestation of some underlying disorder. When these symptoms are found to be in the framework of visual anomalies, then an adequate investigation presumes an understanding of the mechanism of their production.

Scientific philosophy frequently travels a pendulous route, first going to one extreme, then with the revelation of new research it begins to swing in the opposite direction until soon a new extreme is reached. If the two extremes of thought have scientific merit, then it is not long before the oscillations begin to decrease and each group may eventually realize its individual postulate was but a necessary facet of a complex problem. When this realization is reached, then each group is enriched by the utilization of the other groups work.

Today we stand in an era in optometry in which we may look back but a few years to a time when all theories of binocular dysfunction were based on "weak" vs. "strong" muscles. Later, research proved this false by establishing the fact that the extraocular muscles were over 100 times as "strong" as they need be to perform their task. In the advancing thought, optometric theorists borrowed heavily from psychological knowledge and speculation and have for several years propounded a hypothesis that "seeing is learned." A current elaboration upon this hypothesis states that if there are sufficient latitudes or degrees of freedom in the visual process, then a stress will not develop. If a phoria should be produced as a result of a stress, then the development of adequate degrees of freedom would eliminate the stress.

Even as this philosophy disregards structural distortions as etiological factors in binocular stress, so there is another postulate which starts with the assumption that an anatomical dissimilarity exists in the arrangement of the two eyes in their orbits. It holds that such an anatomical derangement would force the organism to continuously strive to maintain binocularity, and that this striving is the cause of stress factors and ultimate discomfort.

"As a man thinketh, so is he," illustrates that a man's philosophy dictates his actions. In the problems of binocular stress, the optometrist's working hypothesis dictates the form of his investigations and largely determines the outcome. For those who adhere strictly to a functional approach to *all* visual anomalies, it would be well to review again the wealth of literature related to structural anomalies and to realize that reason and experience would necessarily dictate that vision is far too complex a function to relegate all explanations to either function or structure alone. Michaels¹⁴ has said of this problem: "That functional changes may lead to structural alteration as well as the reverse is a generally established clinical principle. In fact, the degree of overlap precludes any successful dichotomy regardless of the disorder."

These thoughts emphasize the necessity for a broader concept regarding binocular stress and the realization that some forms of stress may be removed by visual training, but others must be treated by other means.

Latent Binocular Stress

Much has been written about the need for proper differential diagnosis in the case of binocular dysfunction, as it is the tests we take and how we take them which largely shape our philosophy. Properly diagnosing a binocular problem can often become an extremely complex task, involving even the assistance of specialists in other fields. It is not the intent of this discussion to delve into the numerous ramifications of measuring manifest binocular deviations, but merely to refer to *latent binocular stress*. It is here that the vision specialist finds the greatest area for research and pioneering that we know today. To find and treat *latent* binocular stress is a most gratifying professional experience, for this means that it is possible to relieve symptoms which heretofore were considered completely outside our field of practice.

A deeply imbedded latent binocular stress can only be revealed by means of a standardized prolonged monocular occlusion test. By this method, very extensive binocular deviations have been made manifest which previously had resisted all other testing procedures. The finding of such latent stress has

been the key to eliminating chronic symptoms previously classified as psychosomatic.

To determine the necessity for such an exhaustive search for the possible presence of binocular stress, one must understand the symptoms resulting from such stress. Whether or not the symptom is specific or non-specific would be purely academic, because the best therapy for any referred pain is to treat the primary pain mechanism. Furthermore, as Wolff²⁵ so ably illustrates, a secondary or referred pain can eventually become a new source of noxious stimulation and have specific characteristics.

The following list of symptoms has been carefully gleaned from thousands of histories of patients who have found relief through binocular therapy. For simplicity and brevity these symptoms will be listed with but little comment.

1. Headache

These can be bilateral or unilateral in any location of the head. Their onset can be any time of day from the very early morning type, to a late evening or night time variety. The intensity can be from an extremely mild or No. 1 intensity pain to a No. 5 intensity, which totally incapacitates the patient.

A safe rule to follow is that any chronic headache which defies the most careful physical examination and therapy, should be suspected as coming from a binocular stress. The most complete visual analysis that can be made should be the rule and without fail, a prolonged monocular occlusion test should be mandatory.

2. Post Cervical Tension

A very common pain associated with headache is a chronic tension of the upper or cervical portion of the trapezius muscle and the splenius cervicis. It has been ably demonstrated by electromyographic recordings that postcervical tension is also produced when there is a binocular stress. This cervical tension is a most painful malady and in some instances may be more painful than the headache which is so frequently associated with it.

3. Trapezius Tension

After a tension in the postcervical area has existed for a prolonged period, the pain and muscle tension extends down the body of the trapezius muscle and results in tension in the scapular area.

4. Thoracic Area Backache

As the trapezius muscle arises from the spines of the seventh cervical and all the thoracic vertebrae, it is logical to expect that a continuous tension state of these fibers could result in "backache." Wiles²⁷ states, "Pain in the back may be caused by disease or disorder

in function of any structure in the back, that is to say by the vertebrae and intervertebral discs, by the joints and ligaments, and by the muscles and nerves controlling them."

5. Photophobia

As headache is a pain common to many etiological factors, so photophobia is of complex etiology. Nevertheless, in cases of chronic hypersensitivity to light, binocular stress should be suspicioned. Perhaps of all the symptoms, this one is common to almost every case of binocular stress. After the stress has been alleviated, the persistent photophobia diminishes.

6. General Nervous Tension

Study of the tense individual is so vast that no attempt will be made to discuss it other than to refer to the book "Progressive Relaxation" by Edmund Jacobson.⁷ For the understanding of nervous and muscular tension and its therapy there is perhaps no peer. This study of neuromuscular tension shows that because of reflex connections, the nervous system cannot be quieted except in conjunction with the muscular system. Therefore, the ophthalmic practitioner, by carefully heeding binocular stress, can do much to relieve general nervous tension.

7. Anorexia (Appetite Loss)

This is the first or mildest form of gastric disturbance resulting from binocular dysfunction.

8. Nausea

A more intensified gastric disturbance is a marked nausea. This can be either with or without headache, but it is most common in association with the more severe, intense headache.

9. Vomiting

This most extreme gastric effect is usually associated with migraine headache. There are many patients on record who have had complete freedom from the vomiting as a result of the migraine cessation. Yet there are a few cases of frequent vomiting on record which were not associated with migraine headache, yet were relieved with binocular therapy.

10. Nervous Stomach

Any tense individual whose state is aggravated by a chronic binocular stress, can suffer with stomach pain which can be confused with pains of ulcer. The relief of binocular stress can offer enough help to the general tension so as to relieve the pains associated with a nervous stomach.

11. Sleepy Feeling

Generally, this is expressed as a sleepy feel-

ing in the eyes only, rather than a feeling of general body fatigue. It is especially noted on long auto trips or when viewing movies or TV.

12. Insomnia

This seems like a contradictory statement to mention sleepiness and then insomnia, but it actually is not. A common symptom of neurosis is insomnia. It is difficult to sleep in the face of chronic neuromuscular tension. In fact, Jacobson⁷ says that chronic muscular tension in any portion of the body can lead to insomnia.

An illustration of the relationship of binocular stress to insomnia is the case of a woman who for ten years had only slept four or five hours a night. Upon instituting a prolonged monocular occlusion test, she reported that under monocular occlusion she slept eight hours a night and could nap in the afternoon. After the occlusion test and under binocular therapy this same effect continued. This same story has been repeated numerous times in treating binocular dysfunction.

13. Motion Sickness

The most common is car sickness, especially if the car sickness is associated with headache. There is also the confusion of peripheral field movement while riding which causes some people to ride with closed eyes much of the time.

14. Vertigo

Chronic dizziness, or as some express it, a lightheadedness or "unreal" feeling, is commonly found in binocular imbalance. The most severe instance of this was a housewife who suffered vertigo so severely for three years that she could not leave the house alone. Someone always went with her to avoid instability and falling when walking. Following binocular therapy, she reported complete recovery.

15. Slow Reading

Many slow readers who are attending remedial reading classes may not be making satisfactory progress because of latent binocular stress. In marked reading problem cases, a prolonged monocular occlusion test should be a basic requisite.

16. Skipping Lines

In reading or bookkeeping many people become "finger readers" or will use a ruler to avoid the annoyance of skipping lines. This is an excellent clue to the presence of a latent hyperphoria.

17. Monocular Reading

Some people who have a binocular stress have unconsciously learned to shut one eye while reading to avoid the undue tensions associated with reading.

18. Restricted Accommodative Range

In early presbyopia there should be an accommodative range of perhaps 12 to 16 inches. A restricted range to four or five inches is a clue to the presence of a latent hyperphoria.

19. Lowered Stereopsis

A suppression will immediately create poor stereopsis. Therefore, if the cortical control over binocular stress should choose this method for relief, stereopsis is affected.

20. Pulling on Eyes

A pulling or drawing feeling of the eyes is a common complaint of people seeking vision-care, but a severe pulling in the postocular or orbital region is frequently the forerunner of a migraine attack. It is most often monocular, but it can be binocular.

21. Conversational Difficulty

Often a patient will describe a confused feeling while in conversation with another person. It comes from looking at the movement of the mouth, eyes, expression, etc., and results in an inability to look at the person steadily during conversation. These people soon learn to avoid and shun such circumstances.

22. Disturbed Feeling in Crowds

Whenever there is a large gathering of people in motion, such as in department stores, supermarkets, etc., there can occur a feeling of confusion and annoyance to the individual with a chronic binocular stress. Another phase of this feeling comes while looking at rows of symmetrically placed canned goods on supermarket shelves. Many have told me they restrict the length of visits to such places to the absolute minimum.

23. Hyperesthesia

This hypersensitive condition of the skin is generally in the scalp and usually associated with severe headache. It sometimes becomes so sensitive that there is even difficulty combing the hair.

24. Temporary Aphasia

The chronic conflict brought about by a binocular dysfunction emulates the neuroses brought about by emotional conflict. In this instance, people tell how they can be speaking with another person and afterward realize they hadn't really heard them. They had a short period of memory lapse. In a few instances this aphasia was severe enough to make the patient fear an impending psychosis.

25. Periodic Blurred Vision

This symptom is often present in the early morning shortly after awakening. The patient with hyperphoria will complain that it is more difficult to read for a period of from 15 min-

utes to an hour immediately after arising.

This is also a symptom of glaucoma, so a most careful screening should be made to rule out this possibility.

26. Frowning

Chronic frowning causes lines to be etched into the forehead. When these are quite deep there is an excellent chance of a binocular stress. It is quite significant that the forehead of a blind person is often free of such marks.

27. Diplopia

This, of course, is a very obvious symptom of binocular stress, but it is rarely subjectively noticed except in stress of a severe degree. The cortical supervision is of such intensity that rarely will diplopia be mentioned in a history unless an observing person will refer to the ghost images of auto windshields, etc.

28. Depression

A feeling of depression is very common in cases of neuroses, and as the symptoms of binocular stress overlap in so many areas, this is a common symptom in deeply imbedded latent binocular stress.

29. Oculogyric Spasm

Sudden spasmodic gyrations of the globe, especially of an upward rolling nature and associated with excessive blinking have been helped materially, and in some cases completely, by the correction of a latent hyperphoria.

30. Obscure Abdominal Pain

Again, this is a frequent symptom of the neurotic patient. Since chronic binocular stress produces so many overlapping symptoms, it is not unlikely that abdominal pain should be encountered. The first one or two such reports I completely discounted as totally unrelated, but I soon was forced to realize that this was an actuality.

Conclusion

Although this is undoubtedly not a complete study of the symptoms incurred from chronic binocular stress, it is hoped that it may serve as a guide in taking a case history and stimulate more binocular investigation and correction.

318 SW Alder Street

Bibliography

1. Bannon, Robert E., "Symptoms and Case History—The Patient as a Person." *Am. Jr. of Opt.* 1952, 29:275-285.
2. Bridgman, Charles S., "The Optometrist and Psychological Factors in Visual Work." *Am. Jr. of Opt.*, July 1956, 33:341-352.
3. Duke-Elder, W. Stewart, "Text-Book of Ophthalmology." Vol. IV, C. V. Mosby Co. 1949.
4. Foster, Clarence E., "Headache as a Symptom of Visual Disability." *Am. Jr. of Ophth.*, 33:773-776, May 1950.
5. Gordon, B. L., "Importance of Cephalalgia in Ocular Diagnosis," *Arch. of Ophth.*, 11:769-796, May 1934.

6. Hirsch, Sol, "The 'Well' Patient who Feels Sick," *New York State Jr. of Med.*, 55:1170-1174, Apr. 15, 1955.
7. Jacobson, Edmund, "Progressive Relaxation," Univ. of Chicago Press, 1956.
8. Jaques, Louis, Sr., "Corrective and Preventive Optometry," Globe Co. 1950.
9. Jaques, Louis, Sr., *Personal Correspondence and Conversation*.
10. Kilby, Ralph A., "Ocular Vertigo," *Am. Jr. of Ophth.*, 34:290-292, 1951.
11. Krinsky, Emanuel, "The Management of Binocular Imbalance," Lea and Febiger, 1948.
12. Lancaster, W. B., "A Reply to Criticisms of Aniseikonia," *Trans. Amer. Ophth. Soc.*, Seventy Eighth Annual Meeting 1942.
13. Marlowe, F. W., "Persistent Accommodative Spasm Due to Latent Hyperphoria," *Arch. of Ophth.*, 51:223-226, 1922.
14. Michaels, David D., "Optometric Diagnosis," *Opt. Wkly.*, Oct. 25, 1956, P. 1923.
15. *ibid.* *The Opt. Wkly.*, Dec. 13, 1956, P. 2231.
16. Posner, Adolph, "The Prescribing of Prisms for Hyperphoria," *Am. Jr. of Ophth.*, 34:197-199, 1951.
17. Rea, R. Lindsay, "Neuro-Ophthalmology," (Chap. 17 Headache and Amaurosis), C. V. Mosby Co., 1938.
18. Roy, Raymond R., "Ocular Migraine and Prolonged Occlusion," *Opt. Wkly.*, Sept. 3-10-17, 1953.
19. Roy, Raymond R., "Ocular Migraine—A Case Report," *Opt. Wkly.*, Dec. 17, 1953, 2083.
20. Roy, Raymond R., "Case History for the Headache Patient," *Opt. Wkly.*, May 13, 1954, 777.
21. Roy, Raymond R., "Torticollis, Hypertrophia, and Ocular Migraine," *Opt. Wkly.*, Oct. 7, 1954, 1589.
22. Roy, Raymond R., "Headaches and Binocular Stress," *Opt. Wkly.*, Oct. 11, 1956, 1815.
23. Selye, Hans, "The Stress of Life," McGraw Hill, 1956.
24. Simmerman, Harold, "Headaches," presented before Am. Ac. of Opt., Dec. 1950.
25. Sluder, Green Held, "Nasal Neurology, Headaches and Eye Disorders," C. V. Mosby Co., 1927.
26. White, J. M., "Hyperphoria, Diagnosis and Treatment," *Arch. of Ophth.*, 7:739-747, 1932.
27. Wiles, Phillip, "Essentials of Orthopaedics," Little, Brown and Company, 1955.
28. Wolff, Harold G., "Headache and Other Head Pain," Oxford University Press, 1948.

Bankers Get Reading Improvement

Dr. Howard N. Walton, assistant professor at the Los Angeles College of Optometry, recently completed a visual and reading improvement class conducted in Beverly Hills for the American Institute of Banking.

For the vast majority of bank personnel, maximum performance and efficiency in the visual, perceptual and reading skills is of paramount importance. The nature of bank operations and functions place heavy demands upon these skills.

In 1954 the American Institute of Banking recognized this problem and asked Dr. Walton to develop a program that would provide this type of training.

The course was instituted the same year with banking executives and key personnel forming the pilot group. Since that time classes have been conducted during the fall and spring semesters each year at the downtown Los Angeles educational center or in area classrooms.

Much data, particularly valuable to optometrists has been accumulated during the years. When the data is analyzed and statistically evaluated, it will be made available through publication.

Vision Is A Learned Process

"The machinery behind the process of seeing, identifying, or getting meaning is the total organism—we are not testing just a pair of eyes, but the functioning of the organism. Seeing is learned. If someone places something which you have never seen before in front of you, you will likely ask what it is, feel it, maybe taste and smell it. Before I learned what an orange was, for example, it had no meaning for me. But now when an orange is placed before me and I see it, I know immediately that it smells good, can be peeled, sectioned and eaten, and that juice can be squeezed from it for drinking. I get all this meaning via vision having learned it and stored up this knowledge for future reference.

"Thus it is realized that a child in learning to see uses all perceptual methods, all senses, for storing up knowledge which later aids him in getting maximum meaning through vision.

"Because of stresses demanded by our culture the organism is restricted in its area of visual activity. Where we should be using the total of our visual space world we are restricted to indoors, desk-tops, by our culture. Under these restrictions organismic stresses develop. Out of these stresses, if the organism does not get adequate help at the proper time, come our visual problems with resultant losses in achievement."—*Dorothea McCoy, O.D., in an article in the Kansas Optometrist.*

Expand Indiana U. Summer Course

The on campus post-graduate course in "The Theory and Practice of Contact Lenses" offered by the Division of Optometry of Indiana University, July 9-13, has been filled. A second course, therefore, has been opened for the following week, July 15-19. This course will also be taught by Dr. Neal J. Bailey, O.D., Ph.D. assistant professor of optometry. The course is a 30-hour non-credit course, tuition \$60.

Additional course offerings on the campus in Bloomington, Indiana are "Case Analysis," June 4-7, 25 hours non-credit, tuition \$50, instructor Merrill J. Allen, O.D., Ph.D., associate professor of optometry; and "Visual Training and Orthoptics," July 14-17, 25 hours non-credit, tuition \$50, instructor Gordon G. Heath, O.D., M.S., assistant professor of optometry.

Indiana Students Tour B&L Plants

Twenty-three optometric students from Indiana University recently were hosted by the Bausch & Lomb Optical Company's, Rochester, New York. The students spent the entire day at the company's two main Rochester plants. They visited frame and lens production and saw demonstrations of the ophthalmic instruments manufactured by the company.

Arrangements for the tour were made through the Bausch & Lomb Training Department.