

Journal of Optometric Phototherapy



**Mild
Traumatic
Brain
Injury**

**The Circadian
Receptor**

Healing Light for Health

**Syntonics in the
Treatment of
Learning
Problems**

**A Syntonic
Case
Study**

**Visual Signs of
Reduced
Form Fields**

April 2004

The College of Syntonic Optometry is a nonprofit corporation dedicated to research in photoretinology - the therapeutic application of light to the visual system.

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ABOUT THE COVER:

The photo pictured on the cover was taken by Margaret Schermerhorn. We appreciate her contribution. The stained glass window, created by Chris Terrell, is a reproduction of Dr. Edwin Babbitt's famous Chromolume described in his 1878 landmark book, The Principles of Light and Color.

CORRECTION:

An article, "William Henning N.D., O.D. on Myopia" in the last issue did not give credit to the author, Dr. Ray Gottlieb. The editor apologizes.

SPECIAL THANKS:

The College of Syntonic Optometry appreciates the line editing by Anne Barber, O.D. of Puyallup, Washington.

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College of Syntonic Optometry



A NONPROFIT CORPORATION DEDICATED TO RESEARCH IN PHOTORETINOLOGY.
THE THERAPEUTIC APPLICATION OF LIGHT TO THE VISUAL SYSTEM

Dear Colleagues,

It is with great pleasure and excitement that I am writing to report the growth and recognition that Syntonics continues to experience here and abroad. I had the good fortune to participate in COVD's historic "Symposium on Reading Related to Light and Color" in Phoenix. With over 600 OD's in attendance, the largest in COVD history. I presented the role of Syntonics in treating reading and learning related vision problems. I was very well received and many young OD's expressed interest in incorporating optometric phototherapy into their practices. I also had the privilege to address the COVD Board where increased cooperation was pledged by both organizations. COVD also published a series of historic articles I wrote on Syntonics in the Heritage Column as well as "The Use of Syntonics in Treating Brain Injury" in the COVD Journal.

Our cooperative efforts with NORA continue, with further discussions about a joint conference in the near future. CSO was represented at the annual NORA meeting by our vice president Cathy Stern. Cathy also presented a very well received talk on the use of light therapy in the treatment of TBI.

Internationally CSO was represented by myself, Ray Gottlieb, and Sarah Cobb at the LIGHT MEDICINE '03' conference held in November in Antwerp Belgium. At this historic meeting of the thought leaders in color therapy, a new organization: The International Light Association was born. This was the brain child of one of our own, Wim Boeykens, who created and organized the meeting. CSO was recognized for its great contributions in advancing the science of light and color therapy and the significant role it can play in the future as well. I recommend each of you consider joining and supporting this group. One of the various projects of The Association was the University Committee. I just returned from Switzerland where several of us created the first curriculum to offer a BS and MS in Applied Light Science and Medicine at the University of Integrated Sciences of Arbon. Major consideration is given to Syntonics in the curriculum. The university of Arbon is a certified private university which will have cutting edge education and research in fields such as light science. It could provide much of the research we crave to support our work and legitimize the field worldwide.

A benefit of these new global alliances is a wealth of new science and knowledge from the color practitioners of Europe. We will get to hear from several this year and in the near future. This year, at our conference, we will have the privilege of hearing Thrity Engineer, Anadi Martel, and Dr. Alexander Wunsch on some of the most holistic light and color therapies in existence. We will have some of the latest research in the USA which will include Dr. Eells work on treating retinal disease with LED therapies. As usual it promises to be one of the most leading edge conferences in our profession.

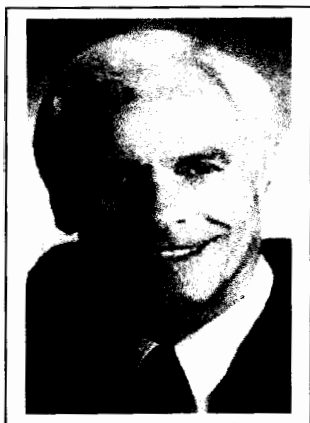
I want to thank the CSO Board and its Officers, and our administrative director Sarah for continuing to keep CSO moving ahead to serve you the members, and the field of optometric phototherapy.

Sincerely yours,



Larry Wallace, O.D., FCSO
President, CSO

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HEALING LIGHT FOR HEALTH

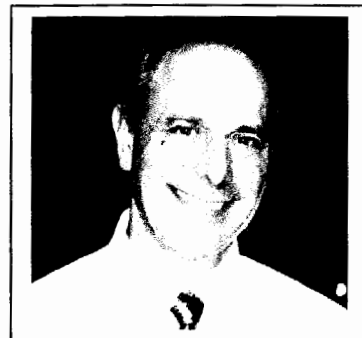
Dr. Lyle earned accredited status in the Academy of Laser Dentistry and a PHD in nutrition. He holds several product patents for low level lasers. Dr. Lyle lectures and teaches on *Proprioception to the Brain* and low level laser therapy.

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MILD TRAUMATIC BRAIN INJURY

Dr. Ray Gottlieb is the Dean of the College of Syntonic Optometry and recipient of the H. Riley Spitler Award. His presbyopia method is now available on video. He lectures internationally, writes, and practices in Rochester, New York.

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THE CIRCADIAN RECEPTOR

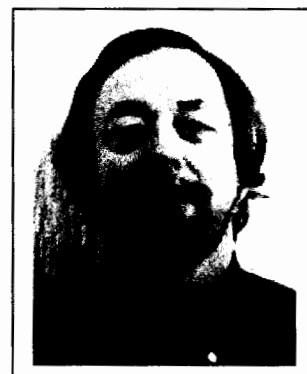
Milena Simeonova, RA, LC is the president and founder of Milena Lighting that designs and implements research-based healthy lighting. Healthy lighting supports the human biological clock, improves performance, enhances sleep quality and speeds health recovery.

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VISION AND LEARNING

Optometrist Geoff Shayler was the first optometrist in England to include syntonics in his practice and obtained Fellowship in CSO in 2001. He lectures on behavioral optometry, functional fields, and syntonics and has published many articles on these topics in Europe as well as the U.S.

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MENTORS TALK – an interview with Dr. Charlie Butts

Sarah Cobb is Executive Director for the College of Syntonic Optometry and Editor of the *Journal of Optometric Phototherapy*. She was asked to present at two International Light Conferences. She also writes novels in her spare time.

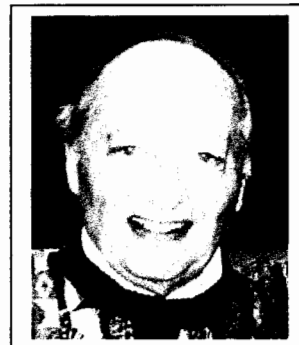
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VISUAL SIGNS OF REDUCED FORM FIELDS

Dr. Ellis Edelman graduated from the Gesell Institute in 1962. He has been practicing Syntonics since 1989. He will soon finish a book entitled *Change Your Mind and See*. His practice of developmental optometry and syntonics is in Newtown Square, Pa.

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SYNTONICS IN THE TREATMENT OF LEARNING RELATED READING AND LEARNING PROBLEMS

Dr. Larry Wallace is the President of the College of Syntonic Optometry. He is an inventor, writer, and speaker who holds patents on bioelectric devices for treating degenerative eye disease. He lives and practices in Ithaca, N.Y.

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SYNTONIC CASE STUDIES

Dr. Betsy J. Hancock practices in the only town in rural north-central Pennsylvania, balancing primary care with vision therapy. All therapy patients are required to do syntonics prior to vision therapy. She would like to teach more basic courses in the future to encourage other optometrists to incorporate syntonics in their vision therapy practice.

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ABOUT THE COVER-

Dr. Edwin Babbitt and the Chromolume

Chris Terrell has lectured internationally on the work of Edwin Babbitt. She created the Chromolume stained glass window pictured on the cover and makes color-puncture wands using antique glass.

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ABOUT THE COVER- The History of the Syntonzizer

Rex Cross has been manufacturing the Syntonzizer and Syntonic Filters for 20 years. He is the founder of C and J Instruments.

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LETTERS

The opinions expressed in this section are those of the writers, and do not necessarily reflect the view of the *Journal of Optometric Phototherapy*. We reserve the right to edit letters as needed. Address email to: Sarah Cobb, eyeamsarah@hotmail.com

Dear Colleagues,

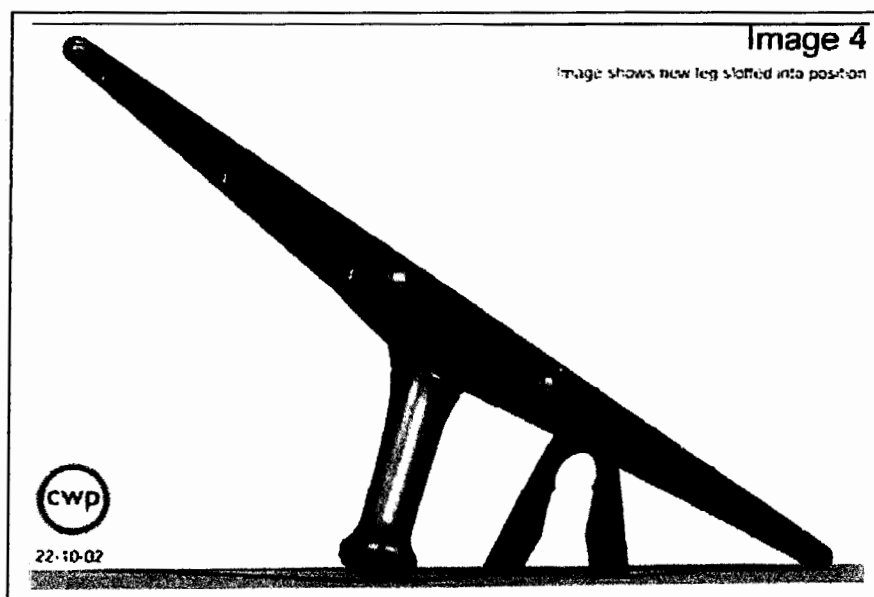
I have developed a new vision exercise product called the E.Y.E. The E.Y.E. is unique in that it uses chromatic aberration in combination with vision exercises to create a rocking action on the focusing and convergence systems without the use of lenses and prisms.

Recently, Pacific University College of Optometry completed an objective evaluation of the E.Y.E. system. The study, conducted on a non-selected, asymptomatic population, assessed changes in visual performance and reading ability following E.Y.E. training.

The results of this study demonstrated that using the EYE for as little as ten minutes a day, over a three-week period, resulted in significant improvements in the ability to aim, track, focus, and use the eyes as a team; as well as enhanced visual resolution, reading efficiency and comprehension.

Within the next few months, my company will be launching a major public relations campaign along with a 30-minute national infomercial. These efforts will bring the public a new awareness of what it truly means to "see" as well as the profound effects of exercising your eyes.

It is anticipated that millions of children and adults will begin exercising their eyes as part of a daily preventive and performance enhancing routine. Many of these people will desire or require reduced prescriptions to support them in their quest for "new vision."



I want every person who uses my new product to be able to easily find a vision therapy oriented optometrist in his or her area. My plan is to create a direct link from the Exercise Your Eyes website to the websites of the College of Syntonic

Optometry, Optometrists in Vision Development, and Optometric Extension Program. In this way, a certified specialist in vision therapy can support any person who needs a reduced prescription or other professional support.

Even though weak vision is currently the biggest health epidemic in the world, the power of vision exercises is still one of the worlds best kept secrets. Very soon, millions of people will be contacting your offices for support. Welcome them. Let's work together to usher in this new paradigm and bring new vision to the world.

Sincerely,
Dr. Jacob Lieberman

Healing Light for Health

By Dr. Larry Lytle

Light has been used to heal, not only the eyes but all tissue, since the beginning of time. Light can be delivered by Light Emitting Diodes (LED) or by Laser (Light Amplification by Stimulated Emission of Radiation) or a combination of lasers and LEDs. Sophisticated miniature computers now provide better control of power density and frequency of the various wavelengths proven beneficial for human cells.

WHAT HAPPENS WHEN CELLS ARE DAMAGED?

The body and all of its trillions of cells are constantly changing as old cells die and new ones form. Old or damaged cell membranes lose electrons due to aging, injury, surgery, disease, free radical damage or invasion by bacteria, fungi and viruses. Injury may result from under or over use of an organ as well as from accidents or over exposure to environmental toxins. When electrons are lost, the DNA blue print is changed so new cells formed are less complete, a process which repeats itself.

Medicine, in general, depends on "diagnosis" before treatment is initiated. When using light therapy, it is not as important to have a diagnosis, since light works at the cellular level. Proper combination and control of laser and LED light can deliver electrons back to the cells, changing damaged DNA back to normal. Loss of electrons in the cell membrane alters the ability of the cell to absorb nutrients. The principle of osmosis is the same as this author taught in biology in the 1950s. When the electric potential of the cell membrane is lost, osmosis does not occur as readily. To state it another way; osmosis does not occur through a depolarized membrane. Aging, injury, disease, surgery, free radical damage and invasion by bacteria, fungi or viruses all depolarize cell

membranes, which in turn decreases the assimilation of nutrients. Many people are taking supplements for specific conditions, including the eye and not realizing that the supplements are not entering damaged cells. Nutrients from the daily diet and supplements are better assimilated into the cell if the electrons are replaced in the cellular membrane with low level laser therapy.

RESEARCH SHOWS LIGHT THERAPY VALUABLE FOR EYES

Research centers in Japan, Britain and the United States have been conducting clinical trials to measure the efficacy of red and near infra-red light in healing injuries and lesions, and for providing relief from acute and chronic pain. Many of these trials have been very successful and they clearly verify that light has a positive effect on damaged cells. The US Government Defense Advance Research Projects Agency is funding research to determine if low level laser or LED therapy is beneficial for soldiers whose eyes have been damaged by high powered lasers during combat. It was found that shining near-infrared radiation on damaged retinal cells can keep them alive and prevent permanent blindness.

People blinded by light may be treated with more light according to a report by Steven Leahy in News Scientist. He found near-infrared wavelengths can boost the activity of mitochondria, the crucial powerhouses in cells. Other studies have shown that low level laser therapy can boost ATP (cell energy) by 150%. NASA is studying the use of light therapy to increase nutrient uptake in cells of astronauts in space. As this research shows, **high powered lasers damage eyes while low power lasers heal eyes.**

WHAT TYPE OF LIGHT CAN BE USED IN THE EYE

Low Level Laser Therapy (LLLT) has been used around the world for forty years. The inability to deliver LLLT deep into all tissue without increasing the power density has been a major problem. When excess energy is applied to the skin, the body releases its protective mechanism called polarization or impedance. Until recent developments this principle rendered most low level lasers unsafe for the eye because power density had to be increased to damaging levels to overcome polarization. The FDA classifies low level lasers as Class I, II, IIIa, IIIb and IV based upon the risk of damage to the eye. Recently 2035, Inc, has manufactured a Class I low level laser that combines several visible and infrared wavelengths of both LEDs and true laser diodes to form a soliton wave. The soliton wave allows the energy to penetrate any where in the body without increasing the power density. This laser, called the Q1000, is classified as a Class I device for safety based upon studies done by Underwriters Laboratory (UL). The FDA has approved several low level lasers for treatment of carpal tunnel and myofascial pain of the shoulder and has other studies underway; however, the FDA has not yet studied the Q1000 or any low level laser for disorders of the eye. As with most developments, the public begins using a device or product long before the FDA gets its studies completed. This is the case with the Q1000 low level laser and current users are reporting success in treating eye disorders.

Low Level Laser Therapy, including the Q1000, works via biostimulation and photostimulation and has a broad range of uses. By increasing production of cellular ATP (cell energy), Low Level Laser Therapy becomes a safe and inexpensive natural healing modality. Its use increases the quality and tensile strength of tissue, provides pain relief, reduces inflammation and is used as an alternative to needles for acupuncture. The photochemical effect is similar to the

photosynthesis process in plants. Cleave Backster, author of Primary Perception, and a researcher on plant energy, states in his monthly report # 7 that Low Level Laser Therapy is beneficial for plants. This is not surprising since everything on Earth is dependant on light and low level lasers are a safe and effective way of delivering light.

Harry Whelan, a neurologist at the Medical College of Wisconsin in Milwaukee, and his colleagues have tested LEDs on eye injuries. Whelan blinded rats by giving high doses of methanol, or wood alcohol. Within hours, the rats' retinal cells and optic nerves began to die. The rats went completely blind within one to two days. The rats were then treated with a 670 NM (nanometer) LED light for 105 seconds, three separate times over a 50 hour span. The rats had an astounding 95% recovery of sight. The retinas of the treated rats looked indistinguishable from those of normal rats and Whelan observed tissue regeneration of neurons, axons and dendrites. This research agrees with research done by Dr. Juanita Anders, president of the North American Association for Laser Therapy. Anders and her team at the Uniformed Services University, Maryland, have documented a number of clinical trials which verify the positive effects of Low Level Laser Therapy on neuronal regeneration following injury. Her studies have shown the ability of Low Level Laser Therapy to inhibit inflammatory cell invasion and swelling in spinal cord injuries. Research has demonstrated that the sooner Low Level Laser Therapy is applied after an accident or injury, there will be less cellular damage and the person will heal three to four times faster. I believe that someday soon all emergency vehicles will carry low level laser instruments for immediate treatment of accident victims.

As sure as light is essential to life, new and better ways of using light for the good of the planet will be developed. Much has already been done, moving science in exciting directions which will improve health and wellbeing for all.

Citations:

- ❖ Atsumi K et al. Biostimulation effect of low-power energy diode laser for pain relief. *Lasers Surg Med.* 1987; 7: 77.
- ❖ Barabas K et al. Controlled clinical and experimental examinations on rheumatoid arthritis patients and synovial membranes performed with neodym phosphate glass laser irradiation. *Proc. 7th Congr Internat Soc for Laser Surg and Med, Munich June 1987.* Abstract no 216a.
- ❖ Boerner E et al. Double-blind study on the efficacy of the lasertherapy. *SPIE Proc.* 1996. Vol. 2929: 75-79.
- ❖ Cheng R. Combined treatments of electrotherapy plus soft laser therapy has synergistic effect in pain relief and disease healing. *Surgical and Medical Lasers.* 1990; 3 (3): 135
- ❖ Cieslar G et al. Effect of low-power laser radiation in the treatment of the motional system overloading syndromes. *SPIE Proc.* Vol 3198. 1997, pp. 76-82.
- ❖ Emmanouilidis O et al. CW IR low-power laser application significantly accelerates chronic pain relief rehabilitation of professional athletes. A double blind study. *Lasers Surg Med.* 1986; 6: 173.
- ❖ Haruki E, Yamaguchi S. Double blind evaluation of low energy laser treatment for painful disease. *J Phys Med.* 1995; 6: 60-67. (In Japanese with English abstract)
- ❖ Hopkins G O et al. Double blind cross over study of laser versus placebo in the treatment of tennis elbow. *Proc Internat Congr on Lasers, "Laser Bologna".* 1985: 210. Monduzzi Editore S.p.A., Bologna.
- ❖ Hoshino H et al. The effect of low reactive level laser therapy in the field of orthopedic surgery. *Chronic Pain.* 1994; 13: 101-109. (In Japanese with English abstract)
- ❖ Hoteya K et al. Effects of a 1 W GaAlAs diode laser in the field of orthopedics. In: *Meeting Report: The first Congress of the International Association for Laser and Sports Medicine.* Tokyo, 1997. *Laser Therapy* 1997; 9 (4): 185.
- ❖ Kamikawa K et al. Double blind experiences with mid-Lasers in Japan. 1985. *Proc. Int. Congr. on Lasers, "Laser Bologna".* 1985.
- ❖ Kim J W, Lee J O. Double blind cross-over clinical study of 830 nm diode laser and 5 years clinical experience of biostimulation in plastic & aesthetic surgery in Asians. *Lasers Surg Med.* 1998; Suppl. 10: 59.
- ❖ Kinoshita F et al. Clinical evaluation of low-energy, semi-conductor laser therapy in oral surgery - a double blind study.
- ❖ Josai Shika Daigaku Kiyo (Bulletin of Josai Dental University). 1986; 15 (3): 735-742. (in Japanese with English abstract)
- ❖ Kosaka R et al. Double blind study of low energy diode laser irradiation for chronic pain disorders. *J Phys Med.* 1993; 4: 156-160.
- ❖ Kouno A et al. The evaluation of pain therapy with low powerlaser- Comparative study of thermography and double blind test. *Biomedical Thermology.* 1993; 13: 102-107.
- ❖ Lonauer G: Controlled double blind study on the efficacy of HeNe-laser beams versus HeNe- plus Infrared-laser beams in the therapy of activated osteoarthritis of finger joints. *Clin Experim Rheuma.* 1987; 5 (suppl 2) : 39
- ❖ Lucas C et al. Low level laser therapy bij decubitus statium III. *Rapport Hoeghschool van Amsterdam.* 1994.
- ❖ Mach E S et al. Helium-Neon (Red Light) Therapy of Arthritis. *Rheumatologia,* 1983; 3: 36. (In Russian)
- ❖ Mester A: Biostimulative effect in wound healing by continuous wave 820 nm laser diode. Double-blind randomized cross-over study. *Lasers in Med Science,* abstract issue July 1988, No 289.
- ❖ Miyagi K. Double-blind comparative study of the effect of low-energy laser irradiation to rheumatoid arthritis. In: *Current awareness of Excerpta Medica.* Amsterdam. Elsevier Science Publishers BV. 1989; 25: 315.
- ❖ Mokhtar B et al. A double blind placebo controlled investigation of the hypoalgesic effects of low intensity laser irradiation of the cervical roots using experimental ischaemic pain. *Proc. Second Meeting of the International Laser Therapy Assn., "London Laser",* Sept 1992, p 61.
- ❖ Mokhtar B et al. The possible significance of pulse repetition rate in lasermediated analgesia: A double blind placebo controlled investigation using experimental ischaemic pain. *Proc. Second Meeting of the International Laser Therapy Assn, "London Laser"* Sept 1992. p 62
- ❖ Neuman I et al. Low energy phototherapy in allergic rhinitis and nasal polyposis. *Laser Therapy.* 1996. 1: 37.
- ❖ Palmgren N et al. Low Level Laser Therapy of infected abdominal wounds after surgery. *Lasers Surg Med.* 1991; Suppl 3:11.
- ❖ Poliakova A G., Gladkova N D, Triphonova T.D. Laserpuncture in patients with rheumatoids arthritis. *Abstracts of ICMART '97 International Medical Acupuncture Symposium, Nicosia, Cyprus, March 26-29 1997.*
- ❖ Rochkind S et al. Double-blind Randomized Study Using Neurotube and Laser Therapy in the Treatment of Complete Sciatic Nerve Injury of Rats. *Proc. 2nd Congr World Assoc. for Laser Therapy, Kansas City,* 1998.
- ❖ Roumeliotis D et al. 820nm 15mW 4J/cm², laser diode application in sports injuries. A double blind study. *Proc. Fifth Annual Congress British Medical Laser Ass.* 1987.
- ❖ Ryo E et al. Double blind test of low energy laser radiation treatment. Evaluation of effectiveness for shoulder stiffness, arthralgia etc. *Pain Clinic.* 1986; 7: 185-192. (In Japanese with English abstract)
- ❖ Saeki N et al. Double blind test for biostimulation effects on pain relief by diode laser. 1989. *Laser Surgery;* 1066: 93-100.
- ❖ Sasaki K et al. A double-blind controlled study on free amino acid analysis in CO₂ laser burn wounds in the mouse model following doses of low incident infrared (830 nm) diode laser energy. *Proc. 2nd Meeting of the Internat Laser Therapy Assn., London,* 1992, p.4.
- ❖ Sato K et al. A double blind assessment of low power laser therapy in the treatment of postherpetic neuralgia. *Surgical and Medical Lasers.* 1990; 3 (3): 134.
- ❖ Scudds R A et al. A double-blind crossover study of the effects of low-power gallium arsenide laser on the symptoms of fibrositis. *Physiotherapy Canada.* 1989; 41: (suppl 3): 2.
- ❖ Taghawinejag M et al. Laser-Therapie in der Behandlung kleiner Gelenke bei chronischer Polyarthrit. *Z Phys Med Baln Med Klin.* 1985; 14.
- ❖ Tsurko V V et al. Laser therapy of rheumatoid arthritis. A clinical and morphological study. *Ter Arkh.* 1983; 55 (7) 97-102. (Russian).
- ❖ Umegaki S et al. Effectiveness of low-power laser therapy on low back pain. Double blind comparative study to evaluate the analgesic effect of low power laser therapy on low-back pain. *The Clinical Report.* 1989; 23: 2839-2846. (Japanese, English abstract)
- ❖ Vélez-Gonzalez M et al. Treatment of relapse in herpes simplex on labial and facial areas and of primary herpes simplex on genital areas and "area pudenda" with low power HeNe-laser or Acyclovir administered orally. *SPIE Proc.* 1995; Vol. 2630: 43-50
- ❖ Willner R et al. Low power infrared laser biostimulation of chronic osteoarthritis in hand. *Lasers Surg Med.* 1985; 5: 149.

Congratulations – Spiller Award Winner, 2004

Soloman Slobins, O.D.

For his commitment, leadership, and dedication in service to the
College of Syntonic Optometry.

- ❖ Wylie L et al. The hypoalgesic effects of low intensity infrared laser therapy upon mechanical pain threshold. *Lasers Surg Med.* 1995; Suppl 7: 9.
- ❖ Yamaguchi M et al. Clinical study on the treatment of hypersensitive dentine by GaAlAs laser diode using the double blind test. *Aichi Gakuin Daigaku Shigakkai Shi - Aichi-Gakuin Journal of Dental Science.* 1990; 28(2): 703-707. (in Japanese)
- ❖ Yoh K et al. A clinical trial for treatment of chronic pain in orthopedic diseases by using 150 mW diode laser system. Result of double blind test. *Chronic Pain;* 13: 96-100.(In Japanese with English abstract)
- ❖ Kim J W, Lee J O. Double blind cross-over clinical study of 830 nm diode laser and 5 years clinical experience of biostimulation in plastic & aesthetic surgery in Asians. *Lasers Surg Med.* 1998; Suppl. 10: 59.
- ❖ Kinoshita F et al. Clinical evaluation of low-energy, semi-conductor laser therapy in oral surgery - a double blind study.
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- ❖ Kosaka R et al. Double blind study of low energy diode laser irradiation for chronic pain disorders. *J Phys Med.* 1993; 4: 156-160.
- ❖ Kouno A et al. The evaluation of pain therapy with low powerlaser-Comparative study of thermography and double blind test. *Biomedical Thermology.* 1993; 13: 102-107.
- ❖ Lonauer G: Controlled double blind study on the efficacy of HeNe-laser beams versus HeNe- plus Infrared-laser beams in the therapy of activated osteoarthritis of finger joints. *Clin Experim Rheuma.* 1987; 5 (suppl 2) : 39
- ❖ Lucas C et al. Low level laser therapy bij decubitus statium III. *Rapport Hoeghschool van Amsterdam.* 1994.
- ❖ Mach E S et al. Helium-Neon (Red Light) Therapy of Arthritis. *Rheumatologia,* 1983; 3: 36. (In Russian)
- ❖ Mester A: Biostimulative effect in wound healing by continous wave 820 nm laser diode. Double-blind randomized cross-over study. *Lasers in Med Science,* abstract issue July 1988, No 289.
- ❖ Miyagi K. Double-blind comparative study of the effect of low-energy laser irradiation to rheumatoid arthritis. In: *Current awareness of Excerpts Medica.* Amsterdam. Elsevier Science Publishers BV. 1989; 25: 315.
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- ❖ Neuman I et al. Low energy phototherapy in allergic rhinitis and nasal polyposis. *Laser Therapy.* 1996. 1: 37.
- ❖ Palmgren N et al. Low Level Laser Therapy of infected abdominal wounds after surgery. *Lasers Surg Med.* 1991; Suppl 3:11.
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- ❖ Rochkind S et al. Double-blind Randomized Study Using Neurotube and Laser Therapy in the Treatment of Complete Sciatic Nerve Injury of Rats. *Proc. 2nd Congr World Assoc. for Laser Therapy, Kansas City, 1998.*
- ❖ Roumeliotis D et al. 820nm 15mW 4J/cm2, laser diode application in sports injuries. A double blind study. *Proc. Fifth Annual Congress British Medical Laser Ass.* 1987.
- ❖ Ryo E et al. Double blind test of low energy laser radiation treatment. Evaluation of effectiveness for shoulder stiffness, arthralgia etc. *Pain Clinic.* 1986; 7: 185-192. (In Japanese with English abstract)
- ❖ Saeki N et al. Double blind test for biostimulation effects on pain releif by diode laser. 1989. *Laser Surgery;* 1066: 93-100.
- ❖ Sasaki K et al. A double-blind controlled study on free amino acid analysis in CO2 laser burn wounds in the mouse model following doses of low incident infrared (830 nm) diode laser energy. *Proc. 2nd Meeting if the Internat Laser Therapy Assn., London, 1992,* p.4.
- ❖ Sato K et al. A double blind assessment of low power laser therapy in the treatment of posttherpetic neuralgia. *Surgical and Medical Lasers.* 1990; 3 (3): 134.
- ❖ Scudds R A et al. A double-blind crossover study of the effects of low-power gallium arsenide laser on the symptoms of fibrositis. *Physiotherapy Canada.* 1989; 41: (suppl 3): 2.
- ❖ Taghawinejag M et al. Laser-Therapie in der Behandlung kleiner Gelenke bei chronischer Polyarthritis. *Z Phys Med Baln Med Klin.* 1985; 14.
- ❖ Tsurko V V et al. Laser therapy of rheumatoid arthritis. A clinical and morphological study. *Ter Arkh.* 1983; 55 (7) 97-102. (Russian).
- ❖ Umegaki S et al. Effectiveness of low-power laser therapy on low back pain. Double blind comparative study to evaluate the analgesic effect of low power laser therapy on low-back pain. *The Clinical Report.* 1989; 23: 2839-2846. (Japanese, English abstract)
- ❖ Vélez-Gonzalez M et al. Treatment of relapse in herpes simplex on labial and facial areas and of primary herpes simplex on genital areas and "area pudenda" with low power HeNe-laser or Acyclovir administred orally. *SPIE Proc.* 1995; Vol. 2630: 43-50

- ❖ Willner R et al. Low power infrared laser biostimulation of chronic osteoarthritis in hand. *Lasers Surg Med.* 1985; 5: 149.
- ❖ Wylie L et al. The hypoalgesic effects of low intensity infrared laser therapy upon mechanical pain threshold. *Lasers Surg Med.* 1995; Suppl 7: 9.
- ❖ Yamaguchi M et al. Clinical study on the treatment of hypersensitive dentine by GaAlAs laser diode using the double blind test. *Aichi Gakuin Daigaku Shigakkai Shi - Aichi-Gakuin Journal of Dental Science.* 1990; 28(2): 703-707. (in Japanese)
- ❖ Yoh K et al. A clinical trial for treatment of chronic pain in orthopedic diseases by using 150 mW diode laser system. Result of double blind test. *Chronic Pain*; 13: 96-100.(In Japanese with English abstract)
- ❖ Neuman I et al. Low energy phototherapy in allergic rhinitis and nasal polyposis. *Laser Therapy.* 1996. 1: 37.
- ❖ Palmgren N et al. Low Level Laser Therapy of infected abdominal wounds after surgery. *Lasers Surg Med.* 1991; Suppl 3:11.
- ❖ Poliakova A G., Gladkova N D, Triphonova T.D. Laserpuncture in patients with rheumatoids arthritis. Abstracts of ICMART '97 International Medical Acupuncture Symposium, Nicosia, Cyprus, March 26-29 1997.
- ❖ Rochkind S et al. Double-blind Randomized Study Using Neurotube and Laser Therapy in the Treatment of Complete Sciatic Nerve Injury of Rats. *Proc. 2nd Congr World Assoc. for Laser Therapy, Kansas City, 1998.*
- ❖ Roumeliotis D et al. 820nm 15mW 4J/cm2, laser diode application in sports injuries. A double blind study. *Proc. Fifth Annual Congress British Medical Laser Ass.* 1987.
- ❖ Ryo E et al. Double blind test of low energy laser radiation treatment. Evaluation of effectiveness for shoulder stiffness, arthralgia etc. *Pain Clinic.* 1986; 7: 185-192. (In Japanese with English abstract)
- ❖ Saeki N et al. Double blind test for biostimulation effects on pain relief by diode laser. 1989. *Laser Surgery*; 1066: 93-100.
- ❖ Sasaki K et al. A double-blind controlled study on free amino acid analysis in CO2 laser burn wounds in the mouse model following doses of low incident infrared (830 nm) diode laser energy. *Proc. 2nd Meeting if the Internat Laser Therapy Assn., London, 1992, p.4.*
- ❖ Sato K et al. A double blind assessment of low power laser therapy in the treatment of postherpetic neuralgia. *Surgical and Medical Lasers.* 1990; 3 (3): 134.
- ❖ Scudds R A et al. A double-blind crossover study of the effects of low-power gallium arsenide laser on the symptoms of fibrositis. *Physiotherapy Canada.* 1989; 41: (suppl 3): 2.
- ❖ Taghawinejag M et al. Laser-Therapie in der Behandlung kleiner Gelenke bei chronischer Polyarthritis. *Z Phys Med Baln Med Klin.* 1985; 14.
- ❖ Tsurko V V et al. Laser therapy of rheumatoid arthritis. A clinical and morphological study. *Ter Arkh.* 1983; 55 (7) 97-102. (Russian).
- ❖ Umegaki S et al. Effectiveness of low-power laser therapy on low back pain. Double blind comparative study to evaluate the analgesic effect of low power laser therapy on low-back pain. *The Clinical Report.* 1989; 23: 2839-2846. (Japanese, English abstract)
- ❖ Vélez-Gonzalez M et al. Treatment of relapse in herpes simplex on labial and facial areas and of primary herpes simplex on genital areas and "area pudenda" with low power HeNe-laser or Acyclovir administred orally. *SPIE Proc.* 1995; Vol. 2630: 43-50
- ❖ Willner R et al. Low power infrared laser biostimulation of chronic osteoarthritis in hand. *Lasers Surg Med.* 1985; 5: 149. Review articles:
- ❖ Wylie L et al. The hypoalgesic effects of low intensity infrared laser therapy upon mechanical pain threshold. *Lasers Surg Med.* 1995; Suppl 7: 9.
- ❖ Yamaguchi M et al. Clinical study on the treatment of hypersensitive dentine by GaAlAs laser diode using the double blind test. *Aichi Gakuin Daigaku Shigakkai Shi - Aichi-Gakuin Journal of Dental Science.* 1990; 28(2): 703-707. (in Japanese)
- ❖ Yoh K et al. A clinical trial for treatment of chronic pain in orthopedic diseases by using 150 mW diode laser system. Result of double blind test. *Chronic Pain*; 13: 96-100.(In Japanese with English abstract)
- ❖ Human gingival fibroblast proliferation enhanced by LLLT. Almeida-Lopes L. [Analysis in vitro of the cellular proliferation of human gingival fibroblasts with low level laser.] 1999. Dissertation at Universidade do Vale do Paraiba, São Paulo, Brazil.
- ❖ Dr Sajee Sattayut of The Department of Oral & Maxillofacial Surgery, St Bartholomew's and the Royal London School of Medicine and Dentistry (professor Paul Bradley) has put forward his PhD thesis on the effect of 820 nm low level laser on patients with TMD (temporo-mandibular-joint-disorders).
- ❖ Luciana Almeida-Lopes DDS, Universidade do Vale do Paraiba, São José dos Campos, Sao Paulo. Análise in vitro da proliferação celular de fibroblastos de gengiva humana tratados com laser de baixa potencia.
- ❖ Julia Kenter DDS, Dental faculty of the UNI Aachen, Germany. Die Anwendung des low-level-laser in der Human, Dental- & Vet.medizin.
- ❖ Navrátil L, Navrátilová B. Possibilities of the treatment of certain diseases in stomatology with the help of non-invasive laser therapy. 382 dental patients were evaluated.
- ❖ Passeniouk A M, Michailov V A. A comparison between laser therapy and drug therapy in the treatment of vaginitis. 30 women with non-specific vaginitis and vaginal candidiasis were treated with LLLT and topical chlorhexidine application daily for ten days. 20 women with the same condition were treated with metronidazole (10 g as course dose) and fluconazole (150 mg single dose) and vaginal application of metronidazole.
- ❖ Ailioaie C, Ailioaie L. The treatment of bronchial asthma with LLLT in attack-free period in children. 98 patient aged 10-18 years, diagnosed with moderate or severe asthma were divided into three groups.
- ❖ Simunovic Z, Ivankovich A D, Depolo A. Wound healing on animal and human body with use of low level laser therapy - treatment of operated sport and traffic accident injuries: a randomized clinical study on 74 patients with control group. A wound healing study on rabbits suggested that 4 J/cm2 was the optimal dose. A clinical study was performed on 74 patients suffering from injuries of soft tissue upon traffic accidents and sport activities.
- ❖ Schaffer M et al. Effects of 780 nm diode laser irradiation on blood microcirculation - study by time dependent T1-wieghted enhanced magnetic resonance imaging (MRI). Six healthy volunteers were irradiated on their right pianta pedis with 5J/cm2 and a fluence rate of 100 mW/cm2.
- ❖ Schaffer M et al. Magnetic resonance imaging (MRI) controlled outcome of ionizing radiation side effects treated with 780 nm diode laser, preliminary results. Three women with painful mastitis after breast ionizing irradiation and a man with an ionizing ulcer were treated with 780 nm, 5 J/cm2.
- ❖ Bjordal J M. Low level laser therapy can be effective for tendinitis: a meta-analysis. A literature search identified 77 randomized clinical trials with LLLT, of which 18 included tendinitis.

- ❖ Prochazka M, Tejska R. Comprehensive therapy of patients suffering from tinnitus. 37 patients suffering from tinnitus (age 18-86 years) were treated in three ways: 1. Rehabilitation: mobilisation, physical training, physiotherapy. 2. Same as 1 but with placebo laser added. 3. Same as 1 but with functional laser added. Laser used was 830 nm 300 mW.
- ❖ Beyer W et al. Light dosimetry and preliminary clinical results for low level laser therapy in cochlear dysfunction. The light distribution inside the cochlear windings produced by irradiation of the tympanic membrane was quantitatively measured ex vivo for wavelengths of 593, 612, 635, 690, 780 and 805 nm.
- ❖ Schindl A, Neuman R. Low-intensity laser therapy is an effective treatment for recurrent herpes simplex infection. Results from a randomized double-blind placebo controlled study. J Investigative Dermatology. 1999; 113 (2): 221-223. 50 patients with recurrent perioral herpes simplex infections (at least once a month for more than 6 months) were treated with 690 nm, 80 mW laser, 48 J/cm², in a double blind study.
- ❖ Marks R, de Palma F. Clinical efficacy of low power laser therapy in osteoarthritis. Physiotherapy Research International. 1999; 4 (2): 141-57. A pilot study used six Sprague-Dawley rats - three controls with no treatment and three that were irradiated for 250 seconds with 630 nm. The interauricular laser therapy of rheumatoid arthritis). Interaurikuliarnaia lazernaia terapiia revmatoidnogo artrita. Sidorov-V-D, Mamiliaeva-D-R, Gontar-E-V, Reformatskaia-Slu. Vopr-Kurortol-Fizioter-Lech-Fiz-Kult. 1999; (3): 35-43. Investigations have proved the ability of interauricular low- intensity infrared laser therapy (0.89 nm, 7.6 J/cm) to produce anti- inflammatory, immunomodulating action in patients with rheumatoid arthritis.
- ❖ Low-intensity laser therapy for benign fibrotic lumps in the breast following reduction mammoplasty. Nussbaum-E-L. Physical Therapy. 1999; 79 (7): 691-698. Fibrotic masses in the breast secondary to fat necrosis or hematoma are a complication of breast reduction mammoplasty. The treatment commonly recommended for this condition is early surgical debridement of necrotic tissue from the entire area, which causes scarring. The patient had some tissue thickening at the time of discharge after 6 months of treatment.
- ❖ Laser therapy: a randomized, controlled trial of the effects of low-intensity Nd:YAG laser irradiation on musculoskeletal back pain. Basford-J-R, Sheffield-C-G, Harmsen-W-S Arch-Phys-Med-Rehabil. 1999; 80 (6): 647-52
- ❖ This study was assessed to investigate the effectiveness of low-intensity Nd:YAG laser therapy in the treatment of musculoskeletal low back pain as a double-masked, placebo-controlled, randomized clinical trial. 63 ambulatory men and women between the ages of 18 and 70 years with symptomatic nonradiating low back pain of more than 30 days' duration.
- ❖ Laser's effect on bone and cartilage change induced by joint immobilization: an experiment with animal model. Akai M, Usuba M, Maeshima T, Shirasaki Y, Yasuoka S. Lasers Surg Med. 1997. 21(5): 480-4. The influence of low-level (810 nm) laser on bone and cartilage during joint mobilization was examined with rats' knee model.
- ❖ Clinical results evaluation of dentinary hypersensitivity patients treated with laser therapy. Brugnera A, Cruz FM, Zanin FA & Pecora Jd. Proc. SPIE Vol. 3593, 1999, p. 66-68. 300 human teeth were treated for hypersensitivity during the period 1995-1997. Pulpal vitality was verified using thermal tests, and only reversible processes were treated.
- ❖ Stimulatory effect of 660 nm low level laser energy on hypertrophic scar-derived fibroblasts: possible mechanisms for increase in cell counts. Webb C, Dyson M, Lewis WH. Lasers Surg Med. 1998; 22(5):294-301. The experiments investigated the effect of a 660 nm, 17 mW laser diode at dosages of 2.4 J/cm² and 4 J/cm² on cell counts of two human fibroblast cell lines, derived from hypertrophic scar tissue and normal dermal tissue explants.

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MILD TRAUMATIC BRAIN INJURY, VISUAL FIELDS AND LIGHT THERAPY

• By Ray Gottlieb, O.D., Ph.D., Dean, College of Syntonic Optometry

Mild traumatic brain injury (MTBI) is one of the most common of all neurological disorders, and the most under diagnosed. Only recently are we becoming aware of the true cost and extent of MTBI. In 1999 the Center for Disease Control (CDC) estimated the direct and indirect costs in the United States of traumatic brain injury at \$56.3 billion and the reported cases of MTBI at nearly \$17 billion each year. According to the CDC publication, *Heads Up, Facts for Physicians about MTBI*, approximately 1.5 million Americans sustain traumatic brain injuries each year. These range from mild to severe. An estimated 5.3 million Americans, 2% of the population, currently live with lasting disabilities resulting from traumatic brain injury. Athletes at all levels of competition frequently suffer cerebral concussions. Approximately 300,000 sports-related concussions are estimated to occur annually in the United States.

The CDC numbers are based on the records of people hospitalized with traumatic brain injury (TBI) each year and do not include those seen in emergency departments not admitted to the hospital, those seen in private doctors' offices, and those not seeking medical care. These are very low estimates of the true cost and magnitude of MTBI's since an undetermined number of cases are unreported and untreated. It is likely that millions of MTBI's are not reported.

About 75% of reported traumatic brain injuries are classified as mild. However, although most MTBI patients recover spontaneously within weeks or months, approximately 15% of patients still have disabling symptoms one year after injury. Complaints of reduced mental efficiency can be long lasting and the apparent severity of the injury does not always predict the severity of the symptoms, especially the impact on emotional and

cognitive behaviors. A seemingly minor injury can cause serious and lasting disability. Studies show that symptoms one year post-trauma are as common after a mild TBI as after a serious TBI.

Many of these patients are more symptomatic at one year than they were immediately after the injury. Symptoms of dizziness, headache, sensory hypersensitivity, impaired attention, poor memory, anxiety, and reduced executive functioning still present at one year are at high risk of being permanent. Even "fully recovered" patients may suffer from fatigue, variations in emotional or cognitive functioning from one day to the next, or coping with psychological stress. Patients report symptoms related to small amounts of alcohol consumption, sleep deprivation, extended travel schedules, and high work demands. They typically complain that they lose things, have difficulty concentrating, forget what they are doing or saying, can't organize their environment or activities, and are overly irritable, depressed, nervous, discouraged, or angry.

MTBI patients can suffer from post-concussion symptoms without being aware of the cause. Symptoms may not appear for weeks post-trauma and may begin subtly and gradually worsen over time. Parents may eventually note a change in their child's behavior but not link it to last month's minor head bump. Adults may not suspect that their headache, irritated mood, chronic fatigue, reading disability, or poor memory is due to a mild head injury. Caretakers may not know to attribute a sudden, rapid increase in Alzheimer's symptoms to a MTBI.

For these reasons, health workers play a key role in the identification, education, and care of brain-injured patients. This professional responsibility is similar to and as important as the identification, education and treatment of

hypertension, diabetes, or glaucoma in patients who present themselves for routine examination with no complaints. We must be alert and aware

that any patient with a post-concussive pattern of symptoms is a possible MTBI survivor.

Signs and Symptoms of MTBI

Cognitive symptoms

- Attention difficulties
- Poor intention span
- Memory problems
- Orientation problems
- Reading/studying problems
- Mental slowing
- Planning/decision making

Physical symptoms

- Headaches
- Dizziness
- Insomnia
- Fatigue
- Uneven gait
- Nausea
- Blurred vision
- Body/neck pain
- Seizures

Behavioral changes

- Irritability, mood swings
- Depression
- Anxiety
- Sleep disturbances
- Eating disturbance
- Play
- Violence
- Emotional outbursts
- Loss of initiative
- Work, school, home

Unexplained symptoms or behavioral alterations should alert us to ask about possible MTBI. At the very least we should educate patients about the importance of wearing protective headgear and avoiding unnecessary risk of repeated mild brain injury. A second MTBI occurring after an extended period of time (i.e., months or years) can result in cumulative neurological and cognitive deficits. Another mild brain injury occurring hours, days, or weeks after the first can be catastrophic or fatal. Recent rules governing school sports require that even with no loss of consciousness, any child with a single neurological sign (e.g. disorientation, slurred speech, confusion) lasting for more than 15 minutes (5 minutes in Indiana) must not be allowed to return to play.

The CDC website contains information and handouts for physicians and patients: http://www.cdc.gov/ncipc/pub-res/tbi_toolkit/toolkit.htm Handouts can be downloaded or ordered. Another source of information is *Brain Injury Source*, the Brain Injury Association of America's magazine for professionals in the field of brain injury. Abstracts can be read at:

<http://www.biausa.org/pages/source.abstracts.html>

Identifying MTBI by measuring visual field

MTBI symptoms are not unique to head injury. Fibromyalgia, chronic fatigue, neurosis, chronic pain (including headaches), toxic exposure, depression, anxiety, and other conditions may present with similar complaints. Chronic fatigue syndrome patients, for example, suffer from photophobia, irritability, difficulty in concentrating and thinking, and depression. Common symptoms of headache, insomnia, fatigue, anxiety, stress, depression, visual discomfort, and impaired information processing have little diagnostic specificity. Even the neuropsychological findings, evoked responses, EEG, SPECT, or statistical manipulation are not reliable biologic measures of "physiologicalness" behind the symptoms.

Measuring kinetic visual fields is important in assessing MTBI impact on any patient with post-concussion symptoms. Visual fields often constrict following MTBI, especially in children. Sometimes field losses do not occur until three or more months post injury. The degree

of field constriction correlates with the physical, cognitive, and emotional symptoms. Over time constricted fields may expand spontaneously and symptoms may improve, but not in every case.

Campimetry is performed by having patients look into the instrument at a black or dark gray paper marked with a central fixation target. The patient's head is positioned at 25 cm from the target. One eye is occluded. The testing probe is a white, 2 mm diameter dot at the end of a black wire. Patients fixate the central target without moving their gaze as the clinician slowly moves the test probe from the periphery toward the central fixation point. Patients report when they first see the white dot. The clinician looks to insure that the patient continues to fixate the central target. Eight meridians are measured and the limits of the field are marked directly on the paper using a white pencil. Name, date, time, eye, target size(s), confidence level and other information are recorded and included in the patient's file.

It is not unusual to find the field concentrically collapsed to within 15° of the fovea. Studies of groups of "normal" school children find between 9 and 20 percent have 15° or smaller fields. The greater the number and severity of post-concussion symptoms, the more likely will the field be constricted and the smaller the field is likely to be. Some children have fields as small as 1° in diameter. These patients suffer significant cognitive, emotional and/or physical symptoms. Sometimes field testing reveals a scotoma (blind area), an enlarged physiological blind spot, or monocular diplopia (the test target looks double).

Kinetic fields measured on a campimeter are valid, reliable, quick, and inexpensive tests to run. Until a few decades ago, campimetry was the standard of care but now is out of fashion. Unfortunately, the instruments most commonly used by today's optometrists and ophthalmologists -- automatic threshold visual field devices -- do not measure post-MTBI type of field constriction. A new automatic test, frequency-doubling technology, does correlate well with campimeter fields if the full (3-5 minute) protocol is used.

A simple clip-board held at 10 inches from the patient's eyes can be used for gross field constriction screening. An 8.5" x 11" piece of white paper is attached to the board. A central

fixation cross (lines 1" long) is drawn in the center. The test probe is a 2 mm black dot drawn on one end of a 0.5" x 8.5" strip of similar white paper. Test both eyes together by moving the target from the top, bottom, left and right -- from periphery to center. The head to target distance and fixation on the central cross must stay constant at all times during testing. A constricted field measuring less than 15 cm in diameter is considered a significant indicator of cortical brain injury. If the binocular field measures normal (to the paper edge), test each eye separately because sometimes the field of only one eye is constricted.

Visual field collapse after head injury has been discussed by leading neurologists in medical journals for more than 100 years. The literature is rich with interesting variations that included targets of differing colors, shapes, and simultaneous presentation of multiple targets. Field results were interpreted to indicate systemic, psychological, toxic, fatigue, and post-concussive diagnosis. Modern physicians are often ignorant of or discount this literature but a revival of interest may be in the wings.

Syntonic Phototherapy

There is no consensus on the appropriate therapy for MTBI victims. The general thought is that injuries will heal themselves spontaneously if the damage is mild enough. The usual medical advice after MTBI, "take a few days off," works well in most cases, but for a significant minority more care is necessary. In some of these cases, where emotional and physical stress impact quality of life, patients may be referred for pain management, psychotherapy, or for stress management counseling to learn to avoid certain situations or activities. Rarely is direct therapy other than physical therapy suggested. More and more frustrated by their disabilities and discomfort, patients are turning to alternative approaches.

For more than seven decades, optometrists have been using syntonic phototherapy -- colored light therapy delivered through the eyes -- for treating MTBI. These treatments usually result in full expansion of constricted visual fields, improvement of mental functioning, and elimination of symptoms. Therapy consists of a 20-minute light treatment 3 to 5 days a week.

Eighteen treatments usually result in lasting recovery. Patients look into a syntonics device at a 2-inch diameter circle of colored light located 20 inches away. Blue/green light treatments are prescribed if symptoms, case history, visual field, and other visual signs suggest a MTBI within the past 30 months. Yellow/green light is used for more chronic conditions. Indigo treatments may be added for headache or pain reduction.

A progress evaluation of fields, symptoms, and other findings after just 7 treatments will typically show partly expanded fields and symptom improvements but not total recovery. If no improvement results from initial treatments, other colors may be prescribed and patients may be referred to their physician for additional tests. As a rule, after 18 treatments visual fields are normal and cognitive, physical, and behavioral/emotional symptoms are gone. Patients are happier, more social, and more functional following syntonics treatment. In some cases vision therapy exercises are prescribed to help patients re-learn lost visual/motor/cognitive skills. Follow up testing at 3 and 6 months usually indicates lasting recovery. In less successful cases, therapy may be repeated with the same or different light frequencies after a break of a few months.

Admittedly, this is hard to believe. The expected questions come to mind.

- If syntonics treatment for MTBI is really so effective, how come no one's heard of it? Until now, there has been little interest in color therapy. Instead there has been resistance to the idea and no financial support for institutional research. Most health insurance does not cover syntonics or optometric vision therapy.

- Is there peer-reviewed, double-blind proof? A few controlled clinical studies have clearly demonstrated field expansion, symptom reduction and cognitive improvement after syntonics treatments but these studies have not been conducted in mainstream research institutions nor published in peer-reviewed journals.

- Can this be explained scientifically? Isn't color therapy more wishful thinking than science? Perhaps, unless one has paid attention to the emerging research on photobiomodulation. A scientific basis for phototherapy is emerging from several fields of research. Studies are being

published in respected journals and mainstream thinking about photobiomodulation and the healing effects of light is beginning to change.

The history of modern phototherapy might be said to have begun on December 10, 1903, when the second Nobel Prize for physiology and medicine was awarded to Niels Ryberg Finsen, MD, of Copenhagen. The prize was given in recognition of his work on the treatment of diseases, in particular of lupus vulgaris, by means of concentrated light rays. The following is quoted from the Nobel acceptance speech: "This method represents an immense step forward and the work of Professor Finsen has led to developments in *a field of medicine which can never be forgotten in the history of medicine.*" This event stimulated research and clinical approaches by physicians in the US and abroad until the Second World War. Syntonics is an outgrowth of this movement.

Thirty years ago, researchers in the USSR and former eastern block countries began using low-energy laser irradiation for promoting the healing of hypoxic, ischemic, infected, or slow healing wounds. Russia has been leading photobiomodulation research and its clinical application. To learn more visit the web pages of the International Society for Optical Engineering, SPIE. Abstracts of their publication, Effects of Low-Power Light on Biological Systems, can be seen at --

<http://www.spie.org/web/abstracts/2600/2630.html>
Also look at

<http://www.laser.nu/lllt/therapylink.htm>

More recently NASA scientists began studying wound healing after determining that the healing process is compromised in zero gravity environments. In 2002-03 several stories about light and color healing appeared in mainstream publications such as Newsweek. Federal and other funding agencies now support clinical research groups investigating the beneficial effects of LED for wound healing in diabetics. A study published in the *Proceedings of the National Academy of Sciences* (3/18/03, vol. 100, no. 6, pp. 3439-44) reported that bathing rats' eyes with 3 brief (150 seconds long) light treatments at 5, 25, and 50 hours following methanol dosing protected them from the blinding effects of methanol toxicity. Similarly dosed control rats without light treatment were blinded by the methanol. These

findings support earlier studies showing that specific wavelengths of light stimulate recovery from ischemic injury, impede degeneration in injured optic nerves, and accelerate wound healing in protracted lesions (including in genetically diabetic mice). The authors of this PNAS study suggest that "light therapy may represent an innovative and novel approach used in retinal injury and retinal diseases, including age-related macular degeneration, glaucoma, diabetic retinopathy, Leber's hereditary optic neuropathy, and other diseases in which mitochondrial dysfunction is postulated to play a role."

The exact mechanism to explain how light works to reduce MTBI symptoms is not yet fully understood. MTBI symptoms most likely result from chronic hypoxia due to an early immune response in which neutrophils in the blood clump together inside the venules causing reduced blood flow and lowered oxygen in the injured tissue. In addition, some of these cells cross the vessel wall into the tissue to form focal pockets of edema. Hypoxic nerve tissue may still function but with sluggish responses, higher thresholds, and slower adaptability. This weak link in a functional brain pathway can be more disturbing to the patient than a more severe injury with total tissue destruction.

In Russia, the methods of photo-hemotherapy, blood irradiation therapy, are widely applied in the treatment of various pathologies. Direct intravenous and extracorporeal (with red, UV, and blue light) as well as transcutaneous (with red and infrared light) irradiation of blood are used. Unlike the treatment mechanisms of local laser therapy, the medical effects of photo-hemotherapy methods are determined by predominance of systemic healing mechanisms above the local ones, increasing the functioning efficacy of vascular, respiratory, immune, other systems, and the organism as a whole. For more information on photo-hemotherapy see:

<http://www.laserpartner.org/lasp/web/en/2003/0058.htm>

Hypoxic tissue can recover if circulation and blood constituents are improved to normalize tissue metabolism. Research indicates that blue light irradiation of blood causes dilation of blood vessels, reduction of blood viscosity, and the

reversal of inflammation and other effects of low oxygen. This happens rapidly and non-locally; that is, systemic changes take place at distances far from the point of light treatment. Constituents of hemoglobin and the complex of reactions and substances involved in tissue respiration have been shown to be light sensitive. Hemoglobin is very similar in structure to chlorophyll, the light absorbing molecule basic to photosynthesis in plant life. It is also quite well accepted that bilirubin, the final product of hemoglobin breakdown is light sensitive. Bilirubin excess causes neonatal jaundice, the cure for which is light therapy. Blue/green light is the most effective to induce bilirubin cyclization.

All this suggests a plausible mechanism by which syntonics phototherapy using blue/green light might work to improve or eliminate post MTBI symptoms. Light shined into the eyes is absorbed by the large supply of blood circulating behind the retina. Only in the eyes do all visible wavelengths have direct access to the blood. The irradiated blood circulates into the brain and throughout the body, dilates the vessels, decreases blood viscosity, and increases oxygen in injured tissue. As inflammation and edema reduce, normal function returns. To learn more about the College of Syntonic Optometry visit: <http://www.syntonicphototherapy.com>

According to literature distributed by the CDC, there is a minor epidemic of MTBI. Hopefully this article will stimulate health professionals to become informed about the subject and to quiz symptomatic patients about possible MTBI. Perhaps visual field testing will become more common practice in doctors' offices. Despite light therapy's success in treating neonatal jaundice and for treating seasonal affective depression, legitimate healing with colored light does not fit mainstream medical thinking. Perhaps it is for this reason that it has not been explored more seriously. However, it is hoped that light mediated medicine will soon gain the credibility it deserves.

The Circadian Receptor and Guidelines for Healthy Lighting

By

Milena Simeonova, Milena Lighting Design

We may be very close to building and living in healthy environments through implementation of healthy lighting. Here I am advancing a concept on what is the circadian receptor and on how it communicates with the circadian system. Knowing this will allow us to treat more effectively with light several health issues linked to the circadian system, such as sleep disorders, seasonal affective disorder (SAD), and depression. It will also allow us to improve night shift alertness, increase employees' productivity during the day, boost students' performance in schools, and just have healthier homes.

The circadian receptor is in the eye – it is the retina. The circadian system can be described as “a giant photocell, monitoring for large amplitude light/dark signals.” There is an interesting study confirming that the lower region of the retina, where usually the image of the sky is formed, is more sensitive to light and found to contribute more to the circadian system (Glickman G. et al., 2003).

Then it was a matter of synthesizing and capitalizing on known facts for the visual system: The visual system is composed of 130 millions of receptive fields in the retina. The visual receptive fields are formed of a nucleus and a peripheral area that have opposite light sensitivity, if one reacts to light, the other reacts to the lack of light or darkness. The visual system is geared towards detecting luminance differences or luminance edges. About 80% of all visual receptive fields will respond only to light of specific color, while only 20% appear to respond just to the amount of light. Oliver Sacks, neurologist who wrote the story of “The blind painter” who states that “colors are the construction of the brain.” The circadian system is ancient and developed much earlier than the visual

system. The visual system has evolved in complexity starting from a simpler circadian system structure. The circadian system is inherent for every biological organism; even single cells have circadian rhythms. Per contrast, the visual system includes reasoning and cognition, fine resolution, preservation of the spatial structure or location of objects, and it responds instantaneously to light stimuli. The circadian system is course and bulky, it responds slowly to light stimuli, detects averaged values of light, and like a giant photocell detects light/dark temporal signals.

At this point, a clear picture of the structure of the circadian receptor started forming. The circadian receptor was similarly structured as a single visual receptive field, but on a much bigger scale. Instead of having millions of visual receptors, the circadian system has only one giant receptor – the eye's retina. Instead of having a nucleus and peripheral area of opposite light sensitivity, it has two regions in the retina, upper and lower retina, that have opposite light sensitivity. The lower region of the retina, where usually the sky is imaged, is the most sensitive to the presence of uniform bright light. The upper region of the retina is the most sensitive to the lack of light or darkness. Because the circadian system is of course sensitive, uniform lack of light is not necessary for the upper region to be activated. A pattern of light and shadows will be averaged and detected as lack of light, activating the upper region of the retina. In an outdoor natural setting, the ground and the trees to about the horizon will be imaged on the upper retina, and the sky will be imaged on the lower retina. In a man-built environment, the floor and the lower surrounding surfaces will be imaged in the upper retina, and lighted ceilings and upper

surrounding surfaces will be imaged in the lower retina.

Further, the communication between the circadian receptor and the circadian system should also be simpler compared to the functioning of the visual system. While the visual system records with meticulous precision the levels of luminance and the location of edges to define visual patterns, the circadian receptor averages in each retinal region the signal of lightness or darkness. Then the signals in each retinal region are compared and the luminance differential of the two retinal regions sets the corresponding activity of the circadian system. For instance, on a summer day, the sky is illuminated brightly, and the luminance differential between the sky and the ground is big. This big light/dark signal triggers the suppression of melatonin and sets high levels of subjective alertness in people. During the night, the sky is dark and the ground is dark, resulting in almost no luminance differential. The signal for no luminance differential triggers the production of melatonin and sets high levels of sleepiness. On gray winter days, the dim light results in a relatively small signal for luminance differential between the two retinal regions. The circadian receptor acts confused, triggering on and off the circadian system, or perhaps putting the circadian system in a state of hibernation. This condition of the circadian system most likely is the source of winter depression (SAD) and sleep disorders. Equally depressing will be a man built environment where all surfaces are lighted similarly, here again the availability of light but no luminance differential will result in hibernation of the circadian system. The circadian receptor, being a two region photocell, detects the luminance differentials as well the availability of light, in order to formulate its response. The detection of luminance differential instead of the absolute amount of light on the retina is a built-in protection mechanism against false triggering of the circadian system. For instance, during the night, there is no luminance differential but there is no light either, so the system will be not in a state of hibernation, and healthy sleep will occur. On a stormy gloomy day, at very dim light conditions, a sleep response will be not triggered.

It is important to understand the temporal nature of the circadian system, with several

processes intensifying and weakening in the 24 hours cycle. In this temporal modulation light is as important as darkness for interaction with the circadian system. Studying what constitutes healthy lighting is very helpful but darkness is equally important for the circadian system.

The fact that colors are constructed in the brain, and represent a more complex cognitive process, one that most likely sets the circadian system as achromatic system, tuned to detect luminance levels. However, colors carry brightness perception and may enhance the light/dark signal on the circadian receptor, especially in man built environments.

The application of temporal modulation of colors is even more promising. Observing spatial (static) white-black strips through a light prism shows the forming of colored fringes at the edge between the white and the black strips. At the edge transition from black to white, three distinct colors are seen starting from the black – violet, indigo, and blue. At the edge transition from white to black, three distinct colors are seen, starting from the white, then yellow, orange, and red. Research has defined the blue color as having the highest biological efficacy, or suppressing the melatonin the most. Research has also defined that red light is best to be used as night lights in hospitals, not to disturb the sleep of patients.

If we translate the static white/ black pattern into a temporal sequence of day/ night pattern, it is easy to conclude that at the transitions from day to night and from night to day, a temporal scrolling through the six colors, will occur. The regulation of the circadian system will be more effective by implementing healthy lighting that subtly shifts between these colors.

To recap on healthy lighting guidelines: The characteristics of healthy lighting for day and night time are different. Lighting during the day shall increase the light/dark signal. Light has to be modulated in intensity and color, in particular during the early morning and the evening hours.

Uniform lighting in the space is not a healthy lighting. Lighting of the upper surfaces (including the ceiling) should be different than the lighting of the lower surfaces (including the floor). Using colors will enhance the healthy lighting. The Mach band effect is a perceptual increase of the

luminance difference at the edge between two surfaces, one light and the other dark. Wall surfaces treated with different color in the upper than in the lower part will increase the Mach band effect and result in a stronger light/dark signal on the retina. Strong light/dark signal will increase daytime alertness and high productivity. Using colored light instead of finishes will allow for greater flexibility.

Lighting conditions in the space shall change subtly or unnoticed with the time of the day and the night. Use light emitting diodes (LED) for healthy lighting. LED are new paradigm lighting sources of

low maintenance, energy efficiency, colored light production, with integral controls, and very flexible, producing different characteristics of light.

If the implementation of healthy lighting in the space is prohibitively costly, it will be possible to apply healthy lighting to the eye retina directly. Optometric phototherapy is a viable alternative of healthy lighted spaces.

May all experience the benefits of healthy lighting.

Let There Be Healthy Light.

STUDENT RESEARCH GRANTS – offered by the College of Syntonic Optometry

The CSO is offering small grants for student research in the field of syntonic optometry. Grants will be awarded to students doing basic research on the effects of colored light on living systems as well as clinical studies on the efficacy of phototherapy on binocular, visual-sensory, visual-motor and visually-related attention/learning/reading problems, ocular pathology, brain trauma syndromes and visually-related symptoms such as headache and asthenopia.

Research grants of up to \$1500 per project are available. Students must work in conjunction with a faculty research advisor and with input from the research committee of the CSO. Grants will be given on the basis of feasibility, scientific soundness and relatedness to syntonic practice or theory. **Contact: Ray Gottlieb, OD, Ph.D., Dean, CSO. EMAIL: raygottlieb@frontiernet.net**

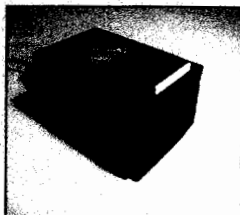
Sorry I Couldn't Make the Meeting in Niagra!

I am the inventor and hold the patent for the Photon Stimulator. It uses a Xenon strobe and color gel slides to deliver pulsed and colored light to the body and the eyes. I have units to suit every need. Check out my website at:

<http://www.PhotonStimulator.com>

There are a variety of suitable attachments for optical applications. They are all reasonably priced since there are no middle men. \$345. I build each unit. I can also build custom units for your specific needs. Credit Cards Accepted.

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Vision and Learning

Can we identify an easy indirect way of comparing functional visual fields and educational ability?

By

Geoff Shayler BSc., FCOptom., FCSO in association with Julie Barsby B.d., M.A.

Introduction

In my article "A New Model of the Island of Vision"¹, I suggested that the size of the functional visual field associated with our ability to identify detail in the periphery is related to the range of clear near vision. Previous research by Dr. John Searfoss², Dr. Eames³, Dr. S. Ingersoll⁴ and others, indicated that up to 20% of children have restricted functional fields, (with an 85% correlation with failure in at least one subject in school), though this figure is somewhat disputed by non behavioural optometrists especially in the UK. In fact many optometric and ophthalmological text books refer to the conditions of malingering and hysterical fields as fairly rare⁵. The effect of a restricted functional field (reduction in the ability to see in the periphery)⁶ leads to:

- poor eye movements frequently compensated by head turning and/or head tilts
- reduced fusional reserves
- reduced ability to converge to a near point
- an inability or slowness in reading letter charts and small print
- a reduction in stereopsis
- *reduced range of clear near vision*^{8,9}
- *poor accommodation* and/or accommodative facility

The result of this in education is related to :

- slow reading
- poor comprehension
- difficulty copying from the blackboard
- difficulty with ball games

There have also been a number of US studies showing the links between poor visual function associated with juvenile delinquency^{10,11,12}

Can we therefore identify children with learning problems and/or behaviour problems by looking at their visual processing function

Study 1 School performance

Structuring the research

On the basis that restricted functional visual fields are linked to a restricted range of clear, near vision and reduced ability to focus in to a clear near point, I wondered if it would be possible to :

- a) identify children with visual processing difficulties by the simple idea of measuring their near and far points whilst reading small print, and,
 - b) whether there was a measurable link between the limitation of this range and scholastic achievement / ability.
- In addition to this we could look at:
- c) any relationship between near point of clear focus and scholastic achievement / ability, and,
 - d) any relationship between these and behaviour

Ms. Julie Barsby, the head teacher of Elmrise School in Bournemouth, Dorset, England, 20 miles from my practice offered to help with this research. This school is estimated to have around 36% of their children affected by learning difficulties.

Study 2 Visual performance

In a practice based study we look at the links between visual performance as used in the educational study and the functional visual field of vision.

Study 3 The effects of vision therapy on these measures

Study 1 School performance **Education and vision**

In England, children are periodically assessed by means of Standard Assessment Tasks (SATs) tests.

From previous tests carried out since the child starts school and the teachers knowledge of the child, the teacher predicts the likely SATs result of each child. The SATs tests are carried out by examination in Math, Reading and Writing, marked by the school but evaluated by external examiner and the results compared.

At Key Stage 1, SATs scores at this age are w, 1, 2c, 2b, 2a, 3, with "w" being the lowest and "3" the best grade. In addition if they achieve the expected grade the grade has a suffix "+", if they fail to meet the expected grade the suffix is "–", and if they exceed the expected grade the suffix is "++".

:

SATS data was produced from the information provided by the school of 90, 6 – 7 year old children, in Year 2.

Children were only identified by a number, (though their identity was known by the school by this number), in order to keep total confidentiality in this investigation

A chart was produced and laminated for use in a school setting. The chart included the instructions and a diagram of its use in Times Roman Font size 8

Classroom assistants used this chart to measure the near and far points of clear vision (just starting to blur) with this chart on each child.

2 groups were excluded in our study

- 1) those that had left the school, and
- 2) those that had not had a SATs target set

These two groups were removed from the list – this accounted for 23 of the original 90 in this school year that were removed from the study leaving a total of 67

We have therefore a well balanced, independent study in order to identify any links between vision and learning with :-

- a) no optometric intervention in obtaining the results
- b) subjective on-going pre assessment of the children by their teacher
- c) objective assessment by examination with results reviewed by an external examiner
- d) a test design simple enough to be used on young children
- e) results simple enough to be obtained by a classroom assistant with no training
- f) subjective assessment of behaviour by the teacher

Study Results

The following is a précis of some of the results published in the UK last year^{10,11,12}

The results obtained from the school were provided in a spreadsheet so that the results would be manipulated to identify the various areas and trends

SATS v Behaviour

The children who were performing above expected level, (++) whatever that level, showed better behaviour than those who were performing below expected level (-)

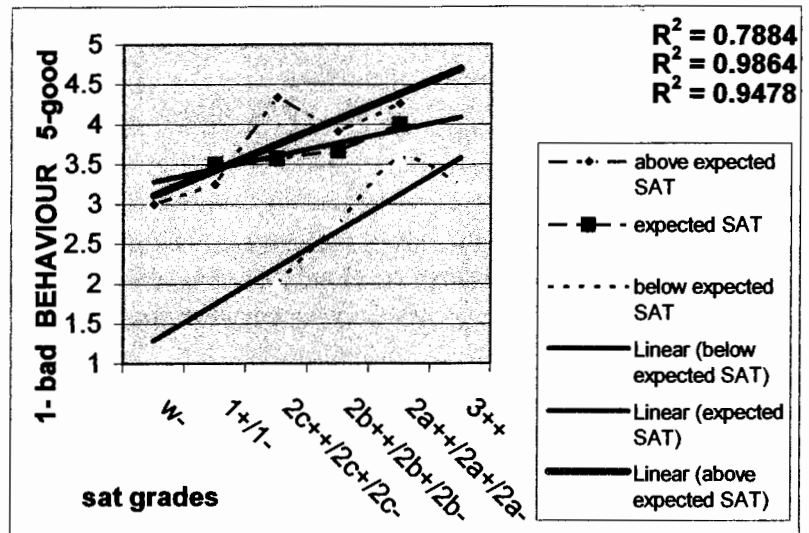
The average child, identified by the teacher as well behaved, is likely to exceed expected SAT performance scores

Poorly behaved children are likely to under achieve their expected SAT performance scores. This link would appear to suggest that their ability to *achieve* at expected SATS level is not necessarily associated with IQ but the ability to *perform* at their projected level.

If they behave, they pay attention,

If they pay attention, they learn

In the next part of the study we will show that vision is related to SATs success. If their visual system is adequately developed, they are able to pay attention and therefore learn— a logical assumption, but here we have the evidence! Conversely if they have poor visual function, they are unable to pay attention, education suffers and behaviour problems occur



Measurements of visual performance

1) Near point (NP) of clear vision, (not convergence)

The chart was used to find the closest point before the print just starts to blur and the distance from the chart to the forehead measured

It was noted that 18 out of 68 (26.47%) have a near point of clear focus 10cms or more. From US research the expected norm of accommodation for 7 year olds is 17D or 5.9cm

2) Accommodative Flexibility (AF)

This is the measurement of the distance between the near point when print starts to blur and the furthest point before print starts to blur.

Research by the author⁴ has indicated a link between the ability to process peripheral information and this range of clear near focus (see later in article)

From this graph it was noted that:-

7 children had a range < 20cm 10.29% suggesting a severe restriction in field
 16 children had a range < 30cm 23.53% suggesting a moderate restriction in field
 32 children had a range < 40cm 47.06% suggesting a mild restriction in field
 From research by the author, the expected "norm" of accommodative facility, when a fully functional field is present, is in the region of 70 - 80cm

Can we determine from this study what is deficient vision?

- 1) 26.47% have a near point of clear focus 10cms or more compared to the expected norm of accommodation is 17D or 5.9cm
- 2) 23.53% had an accommodative facility range < 30cm suggesting a moderate restriction in field

It was felt that from the earlier results it would be appropriate to look at :-

- 1) the relationships with near point > or < 10cm
- 2) accommodative flexibility < or > 20 / 30 / 40 cm ranges

Data "crunching"

Utilising the data provided by the school the results of various groups were averaged in order to identify if there were any links between the visual limitations of reduced near point and reduced accommodative flexibility and academic ability / performance

Would this identify those children suffering from difficulties in school due to deficient visual processing?

In the next group of investigations, the data utilised was obtained by looking at the numbers of children in each selected category against those in the opposite as a percentage.

i.e. the percentage of children with near point <10 in a particular group against a matching group with near point >10

Summary of vision deficits and educational under performance

i.e. achieving below expected SAT level

Children (year 2) with a near point greater than 10cm are :-

104% more likely to under achieve in at least one subject
195% more likely to under achieve in two or more subjects
412% more likely to under achieve in all three subjects
 than those with near point less than 10cm

Children (year 2) with accommodative flexibility >20cm / >30cm / >40cm are :-

103% / 121% / 103% more likely to under achieve in one subject
134% / 177% / 144% more likely to under achieve in two or more subjects
247% / 310% / 112% more likely to under achieve in all three subjects
 than if their accommodative flexibility is <20cm / <30cm / <40cm

Summary of the relationship between vision and under achievement in specific SAT subjects

These are those children with a - coding beside their SAT score

SATS comparisons under achievers with near point of clear vision

Children (year 2) with a near point greater than 10cm are :-
119% more likely to *under* achieve in Maths
155% more likely to *under* achieve in Reading
156% more likely to *under* achieve in Writing
 than those with near point less than 10cm

SATs comparisons in specific subjects of under achievers with reduced accommodative flexibility

These children (year 2) were identified as being :-
128% more likely to *under* achieve in Maths
162% more likely to *under* achieve in Reading
153% more likely to *under* achieve in Writing
 if their accommodative flexibility is <30cm compared to those >30.

Summary of the relationship between vision and exceeding educational expectations in specific SAT subjects
These are those children with a ++coding beside their SAT score

SATS comparisons of children exceeding educational expectations with near point < 8 cm
Children (year 2) with a near point less than 8 cm are :-

181% more likely to *exceed* expectations in Maths
387% more likely to *exceed* expectations in Reading
No change in likelihood to *exceed* expectations in Writing than those with near point greater than 8 cm

SATS comparisons of children exceeding educational expectations with accommodative flexibility >40 cm.
Children (year 2) with accommodative flexibility >40 cm are :-

207% more likely to *exceed* expectations in Maths
221% more likely to *exceed* expectations in Reading
57% more likely to *exceed* expectations in Writing than those with accommodative flexibility <40 cm

How strange that there is not a corresponding SATS improvement in writing in both good near point and good accommodative flexibility whereas there is a substantial likelihood of exceeding expectations in maths and reading whereas those with poor visual skills have an higher risk of underachieving in this subject

Progression Accommodative. Flexibility. < 40 = most at grade "w", least at grade 3

Progression Accommodative. Flexibility > 40 = least at grade "w", most at grade 3

Do the results obtained suggest that it is now possible to identify those children who are failing in school due to visual problems with these simple tests

Analyzing the data the following results were obtained :

- **47% of children with an accommodative flexibility < 30cm are statemented***
- **15% of children with a reduced near point of clear vision >10 cm are statemented***
- **47% of statemented* children have visual processing problems that this study suggests is associated with a restricted functional field**
- **26% of children have reduced near point of accommodation**
- **24% had a substantial limitation of accommodative flexibility (related to restricted field of vision)**

*statemented children are individuals who have been identified by the educational system as requiring additional 1 to 1 teaching because of their learning difficulties for which the school receives additional funding from government

The AF/NP ratio

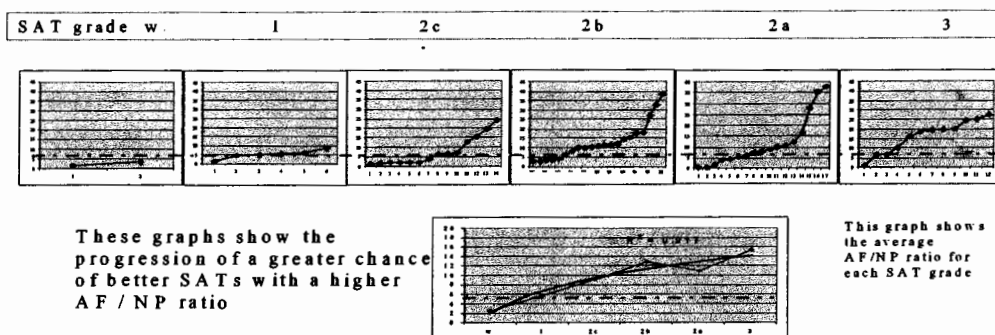
This study has shown that there is a link between poor academic performance and both near point of clear focus (NP) and also the accommodative flexibility (AF). As both these measurements are linked to functional visual field restriction, can we combine them to create a more accurate diagnosis of children failing in school due to visual processing difficulties

(The "AF/NP ratio" is the measurement of accommodative flexibility divided by the near point of clear focus)
For each child, the AF/NP ratio was calculated. From the results obtained the following was identified. The AF/NP ratio was plotted in a separate graph for each SAT grade.

There were 27 (37.5%) children found to have a AF/NP ratio < 6 and 45 to have a AF/NP ratio >6 giving a total of 72 children in this part of the study

Here we see the plots of the AF/NP ratio for each child in the study for each SAT grade

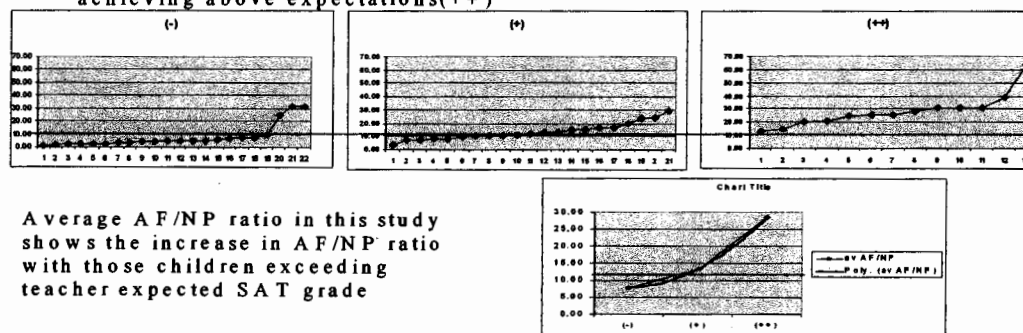
The red lines denote the "cut off" point where the AF/NP ratio = 6



Is there a relationship between the AF/NP ratio and the ability of the child to perform at teacher expected level

The following graphs show the AF/NP ratios for each child in the study in each group -

underachievers(-),
achieving teacher expected(+), and
achieving above expectations(++)



Under achievers have a low AF/NP ratio, those exceeding teacher expected have a high AF/NP ratio. These graphs show the importance of this ratio.

Conclusion

- If a child has a AF/NP ratio <6, he has approximately a **36%** chance of only achieving at the lower SAT grades of "w" or "1"
- If a child is achieving at SAT grade "w" or "1" then he is **72.5%** more likely to have a AF/NP ratio <6, than if the AF/NP ratio is >6
- If a child has a AF/NP ratio >6, he has approximately a **18.5%** chance of achieving SAT grade 3, if <6 this is only **4.9%**
- If a child is achieving at SAT grade "3" then he is **86.2%** more likely to have a AF/NP ratio >6, than if the AF/NP ratio <6

This study shows a substantial link between vision as measured by the AF/NP ratio and educational achievement as measured by SATS school tests.

Assessment of results

This study⁸ is showing a definite link :-

- a) between reduced accommodative flexibility and under achievement in SATS results *but only where more than one subject is involved*
- b) between reduced near point and under achievement in SATS results *but only where more than one subject is involved*
- c) These figures all (but writing) show an increased likelihood of exceeding expectations with a “good, close” near point of clear vision compared to those with a poorer further near point
- d) These figures all (but writing) show an increased likelihood of exceeding expectations with an “extended” range of clear, near vision, accommodative flexibility, compared to those with a more restricted range
- e) In relation to behaviour, worst behaviour was found to be associated with farthest near point
- f) In relation to behaviour, worst average behaviour is related to those with more restricted accommodative flexibility, about 35cm – to an average accommodative flexibility to about 55cm with those with best behaviour

From the data provided by the school, further investigation will be taking place, but I feel there is sufficient information to stimulate further research in this area

Study 2 Visual performance Optometric studies in Practice

The Campimeter-

The three levels of testing as taught by Dr Wayne Pharr OD¹³ using the Rex Cross Campimeter

Level 1) The Awareness field

The field is plotted by moving the 5mm (2 degree) white target in towards the centre from non-seeing to seeing with the patient advising as soon as they first see the test target whilst concentrating on a small cross at the centre of the target. The point at which they first observe the target is marked on the chart. The vertical, horizontal and oblique meridians are measured.

This is the field that you have the potential to use at this time - that is actively wired up to the brain, ready for use!

Level 2) The Perceptual field

Place the target near the centre and ask the patient to notice that there is a black ring around the target. Explain that their job this time is to again concentrate on the centre, but as they notice the white spot coming in, they are to tell you when they are first aware that the white spot has a black edge to it. Mark the chart and continue to test as before.

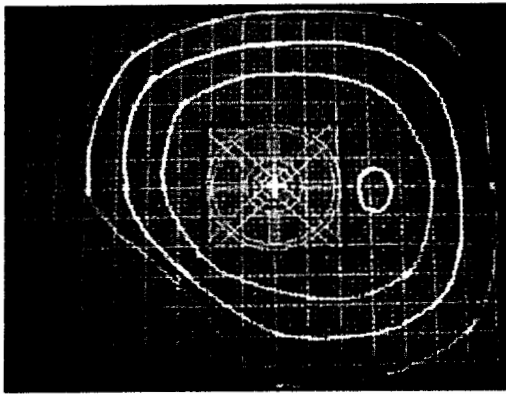
This is the field you use when walking, being aware of things and reacting to them, mind that dog, where is the kerb, etc.

Level 3) The Activation level

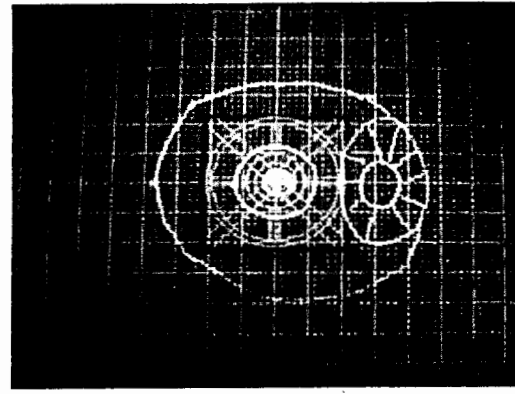
Place the target near the centre and ask the patient to notice that there is a complete black ring around the target. Explain that their job this time is to again concentrate on the centre, but as they notice the white spot coming in, they are to tell you when they are first aware that the white spot has a complete black ring around it

This is the field that is used for detailed viewing such as reading

In my experience, in a normal field, measured on the Rex Cross campimeter, levels 1, 2, & 3 are generally reduced about 5 degrees between each level with the horizontal diameter of level 1 about 55 degrees.



Normal visual fields



Restricted fields

Many children with reading problems have fields substantially more restricted than the field shown above with the first level being as small as just 5° or less! and the inner fields too small to measure.

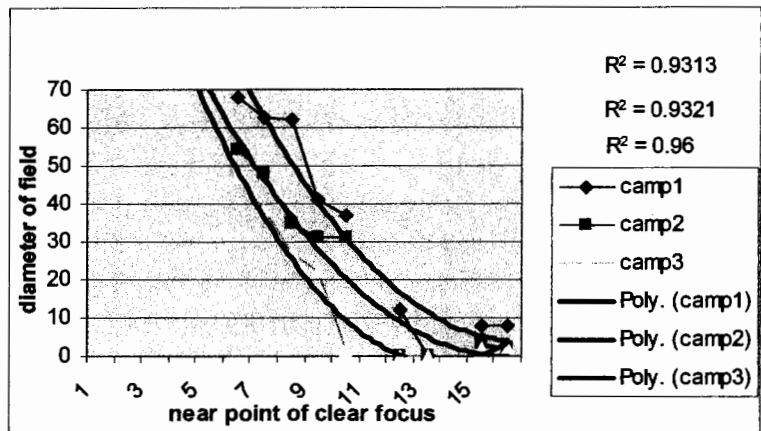
Note : Whenever the level 2 and level 3 fields are restricted, the physiological blind spot is always enlarged as shown in the plot above. This is a useful check that confirms that the field is restricted and not due to the incompetence or vagueness of the patient.

This study was taken on a group of 40 children attending for routine vision assessment, (some of the more serious undergoing therapy later when the fields expanded to normal. The results were plotted in Microsoft Excel and the polynomial trend lines and R^2 values for each curve calculated in this program.

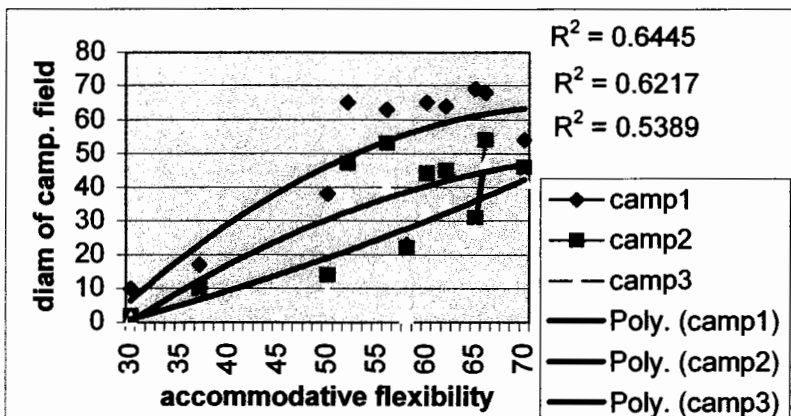
The relationship between near point and the diameter of the functional visual fields

The average campimetry diameter for the three “fields” as described above for each measure of near point found in the study was plotted :

The result of this graph shows a highly significant relationship – the larger the functional visual field, the closer the near point of clear focus



The relationship between accommodative flexibility and functional visual fields

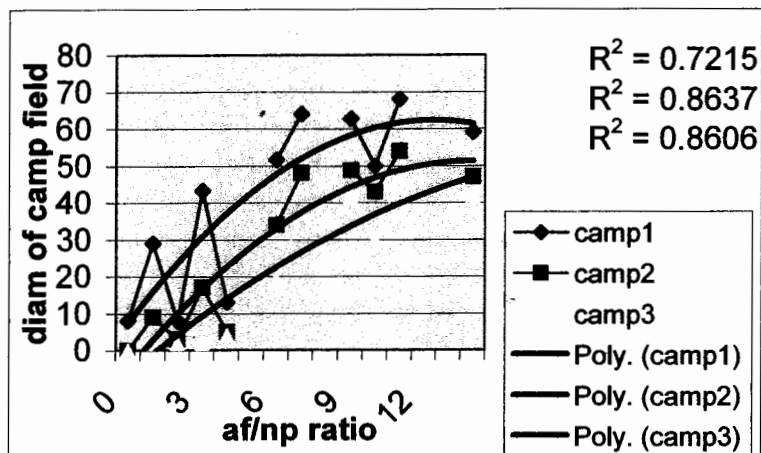


In view of the evidence that when the functional visual fields are restricted there is an extension of the near point of clear focus and a restriction of the accommodative flexibility we can obtain an AF/NP ratio to exaggerate the effect

The relationship between the AF/NP ratio and functional visual fields

These three graphs show statistically acceptable (polynomial trend lines) link between :-

- 1) the diameter of the functional visual field and the near point
- 2) the diameter of the functional visual field and accommodative flexibility
- 3) the diameter of the functional visual field and the AF/NP ratio.
- 4) There is the highest statistical relationship between the functional field measurements and near point which may be due to the greater subjective ease of determining blur at near indicating that restricted functional visual fields are associated with :
 - 1) an extended near point of clear focus
 - 2) a reduced range of clear near focus
 - 3) a reduced AF/NP ratio



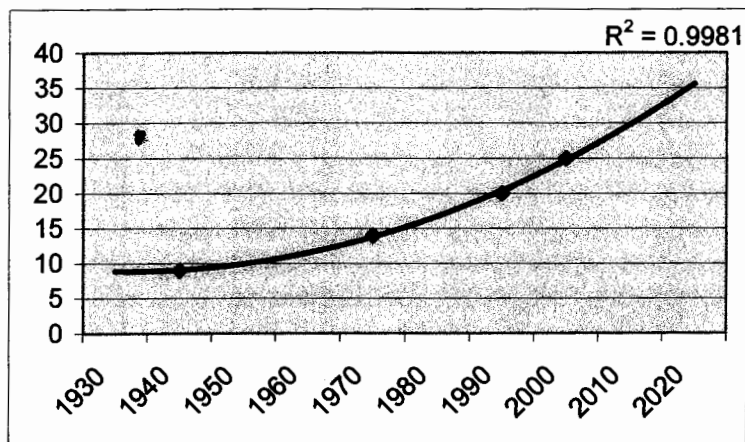
Conclusions

- 1) The functional visual fields can be statistically compared to :-
 - a) the near point (NP) of clear vision
 - b) accommodative flexibility (the distance between the near and far points of clear vision)
 - c) the AF/NP ratio
- 2) There are major links between these measurements and the ability of a child to :-
 - a) achieve in school as assessed by the SATs tests
 - b) achieve at teacher expected levels as assessed by the SATs tests
- 3) The simple measurement of near and far points of clear near vision can identify about 25% of the children in this school year as performing below their potential
- 4) About 80 percent of the children who are underachieving in this school are doing so because of a visual processing problem
- 5) Not only does this study identify those who are failing in school, it also identifies those who are excelling at school and thus these children can be identified to allow them to progress even better!

This study has not looked at VAs. Refractive errors, eye muscle anomalies, New York battery or any of the normal research tools that have been used in the past in the US to investigate the link between vision and learning. There have been very few investigations into learning and vision in the UK other than the provision of coloured lenses /overlays.

This test of measuring near and far reading ranges is simple,
It can be carried out without any training
and identifies those children that are ideal candidates for vision therapy in association with syntonics phototherapy

A worrying trend?



I have plotted the results published of the incidence of functional visual field restrictions in school populations by Eames, Gottlieb, Searfoss and myself against the decades they were studied. Though we cannot really compare these different studies as they will have used different criteria, I find it interesting that they should show such strong statistical evidence that this problem is getting worse.

Part 3 The result of vision therapy on these measurements

This is a retrospective study of 22 patients who have undergone therapy in my practice over the past few years.

Vision therapy was, in most cases, carried out over a 2 week period using an intensive VT program developed in association with Dr Wayne Pharr, seeing the child 2 x day for 1 hour with a 3 hour gap in the middle. During this time around 40 different activities were utilised to develop the 5 "F"s :

- Fields - syntonio phototherapy
- Fixations – eye movement / convergence activities
- Focus – developing fast efficient accommodation
- Fusion – developing fusional reserves
- Flexibility – integrating the above with whole brain / body movement control

This study looked at the effect of VT on the following :

The recorded measurements of the :

- near point (NP)
- the far point of reading ability
- and Campimetry (measured at three different levels of processing difficulty)

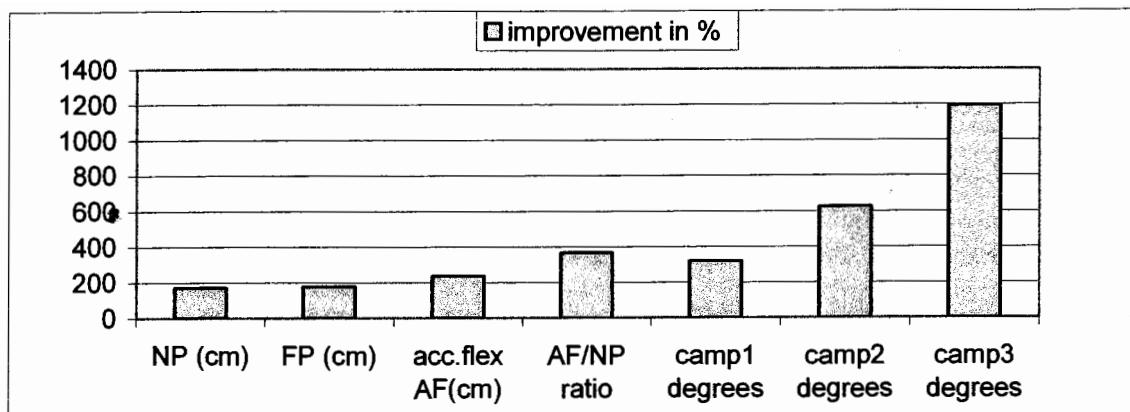
From these results it is also possible to identify the :

- accommodative flexibility (AF), and the,
- AF/NP ratio

The results

The average recorded measurements for each group are tabulated below

	NP (cm)	FP (cm)	acc.flex AF(cm)	AF/NP ratio	camp1 degrees	camp2 degrees	camp3 degrees
average pre VT	13.06	35.00	23.00	2.16	18.61	6.89	2.89
average post VT	7.64	61.77	54.14	7.96	59.50	43.00	34.50
improvement in %	171	176.49	235.39	368.52	319.72	624.09	1193.77



These studies showed that following VT there was an averaged improvement in the following:

- reduced (improved) near point of clear focus of 171%
- and an extended far point by 176%
- an improvement (extended) in the accommodative flexibility (AF) by 235%
- the AF/NP ratio increased by 368%
- Campimetry field 1 (The Awareness field) – field diameter increased by 319%
- Campimetry field 2 (The Perceptual field) – field diameter increased by 624%
- Campimetry field 3 (The Activation field) – field diameter increased by 1194%! – *and this is the important field that relates to reading ability*

This leads to an increase in the available volume for reading of 33,498%!

Does this suggest that scholastic performance should be enhanced following VT? The studies published by Dr. Stephen Ingersoll and Dr. Paul Harris certainly show this is the case. Perhaps this article indicates that it is near visual performance and functional visual fields that are of primary importance in optometric assessment and should both be addressed in the treatment regime of children with learning difficulties

Further research – help please!

If this simple test can give us this sort of data, then we can start to look at the limitation of accommodative flexibility on different ages and different school locations etc.

At present, though there are a number of papers published on restricted fields in children there is little knowledge of what happens at different ages, (One suggestion is that about 45% recover their fields in mid teens). If anyone would like to try a similar study in their area, I would be happy to provide information on how this research was carried out and provide the charts etc.

I would also like to see more information on the links between accommodative flexibility and visual field measurements.

The more data we can obtain on these children, the more we prove that these children have visual processing problems and the more likely we will be in the future to obtain funding to help these children with VT.

References:-

- 1) Shayler G R., A New Model of the Island of Vision¹, presented at ICBO Conference Nov 2002 Versailles / published Journal of Optometric Phototherapy, April 2003-
- 2) Searfoss J, & Garzia R. Tunnel vision, a loss of visual sensitivity in school age children. Journal of Optometric Vision Development 2000; 21(3):117-130
- 3) Eames T.H. Restrictions of the visual fields as handicaps to learning Jrnl of Edu 1936;
- 4) Ingersoll, Integrated Vision and Learning, CSO conference 1998
- 5) Evans, B The Role of the Optometrist in dyslexia, Part 2, Optometry Today 27.3.04

- 6) Shayler G. R., Functional visual fields - Their importance in the assessment of children with educational difficulties, Optician August 11, 2000 No 5763 VOL 220
- 7) Shayler G. R., Identifying Functional field problems in Adults and their relationship with reading range, Societe d'Optometrie d'Europe 179, 2003
- 8) Shayler G R Identifying Functional Visual Field problems in Adults, , Journal of Optometric Phototherapy April 2002
- 9) Zaba, Johnson, Nottingham, Straton, The vision screening of academically and behaviourally at-risk pupils, Journal of Behavioural Optometry Vol 7 1996 number 2
- 10) Zaba, Johnson, The visual screening of adjudicated adolescents, Journal of Behavioural Optometry Vol 10, 1999 number 1
- 11) Bleything, Juvenile Delinquency: The role of Optometry in remediation, Journal of Behavioural Optometry Vol 9, 1998 number 4
- 12) Childhood visual problems and education Part 1 Near point and educational performance, Optometry Today, Oct 2003
- 13) Childhood visual problems and education Part 2 Educational performance and accommodative flexibility, Optometry Today, Oct 2003
- 14) Childhood visual problems and education Part 3 Educational and visual performance links, Optometry Today, Nov 2003
- 15) Fast, Shayler, Pharr, Functional Visual Fields and Dural Torque, Journal of Optometric Phototherapy, April 2000 (US)

Thanks to Ms. Julie Barsby, B.Ed., M.A. Head teacher, the staff and pupils of Elmrise School, Bournemouth, Dorset, for carrying out the "vision" testing, child behaviour assessments, and, provision of SATS results

My thanks also to Professor Roger Baker , Dorset RDSU* co-ordinator for his assistance in preparing this paper. Professor Baker has worked as a researcher and clinical psychologist at Leeds, Bournemouth, and Aberdeen Universities and in NHS trusts specialising in mental health. He is Visiting Professor at Bournemouth University and Visiting Professor at the Royal Hospital for neuro - disability at Putney and Consultant Psychologist with the Dorset Healthcare NHS Trust
 (* Dorset Research and Development Support Unit based at Poole Hospital NHS Trust)

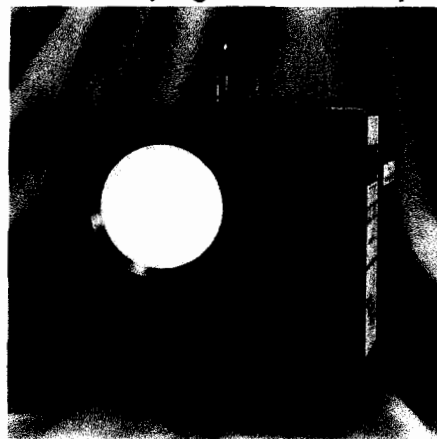
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Mentors Talk

A Conversation with Dr. Charlie Butts

By
Sarah Cobb

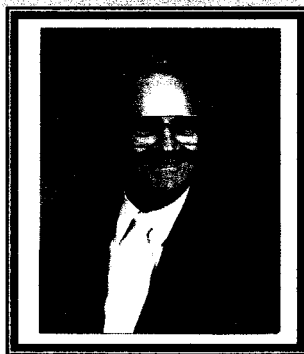
1. **How did Dr. Spitler view the body?** Dr. Spitler was an optometrist and a medical doctor and a brilliant inventor to come up with a conclusion that the body is controlled by two main interactive systems, the electrical and the chemical. You can control the chemical by using the frequency that is in phase with the thalamus to stimulate the correct motor response. Also you can control the electrical by using the proper chemical. For the same purpose. The syntonizer was made to go through the eye to the centers of the brain that controlled the centers that controlled the pathways to organs that need this energy to heal. Simply, he put the proper input that was needed to get the proper output.
2. **Tell us about your first syntonic success.** Well, One of the first ones was a woman that was 20/300 in both eyes and bringing it back to 20/40 in 15 treatments. Yes. I couldn't believe what took place in such a short time. I had brought one instrument at the basic in three weeks I had to order another one and then another one. I had three working most of the time. Before I retired I was doing an average of 23 patients a day.
3. **How did you come up with the treatment schedule of 20 minutes 5 times a week for a series of 20 treatments?** I discovered by using this sequence I could correct 80% of complaints and not have them relapse. Dr. Henry found that it took 3 days of therapy to get the body to retain the input we wanted and it had to be reinforced with no more than 2 days off to maintain this input at a very high level. Less than 3 days a week is a waste of time. After you discontinue therapy it takes about 7 days for it to get out of the system. That is why you should run fields again a week after therapy then again in 3 months. If the optic nerve head is becoming enlarged then you will have to give another series.
4. **What's wrong with sending light home with patients?** It is one of the worst mistakes and it is bordering on malpractice. Why? Often you have to closely monitor a case. Only a functional field measurement will tell you if you are using the proper frequency to cure the visual problem. You are letting go of this tool. I know many of my hard cases I had to run fields every 2-3 treatments to make sure I was doing the proper treatment and accomplishing what I wanted. . I had to change many to make stronger or weaker as the fields and complaint indicated. Once an Instrument leaves your office, you have lost control of the patient. Better make your make your malpractice insurance several million ,because you are asking for it!
5. **Charlie, How do you feel about the use of glass filters verses plastic?** Glass, with the proper chemical elements, with the thickness needed for the proper affect for the ionization of the frequency [page 129 and 146 Spiller], and to produce the frequency in phase to the receptor, rods and cones. Both the eye and the frequency have to be in phase to work properly. Plastic filters don't offer the same results. Cleaning them daily with 180 proof alcohol is important.
6. **Do you care to make a comment about the affects of filters?** Take the sympathetic for example, what is a sensory stimulant verses a motor stimulant? You have a pair of glasses on a table and you want to pick it up. First you see it and send the image to the brain for processing [Sensory]. The brain processes this and sends a impulse to the muscles to pick it up[motor]. This is as simple as I can make it. Mu is the physiological balancer. Mu delta means the mu is altered by delta, You alter mu with a

motor stimulant. Mu upsilon means mu is altered by upsilon. You alter mu with a sensory relaxer. Since you always put the mu filter closest to the eye .It is the final filter that these frequency's are adjusted to.

7. **Okay, Charlie, does it make a difference if you put delta in front of mu?** Yes, you then are adjusting delta with mu They are not the same.
8. **I understand the special vibration bulb is no longer available in 50 watts. Do you have any suggestions?** Spitler used a 105 volt, 50 watt, vibrant bulb, boosted to 125 volts. When we could no longer get it we switched to a 120 volt vibrant boosted to 145 volts because we could get the same results that way. It is important to use a vibrant bulb because it pulsates toward the patient. According to Spitler, he never got the results he wanted until he used the vibrant bulb. Today, a vibrant bulb in 40 or 60 watts can be bought at Home Depot.
9. **What roll does stress play?** Remember you find a visual stress problem it also causes a physiological stress, emotional stress, accommodative stress. Any one will cause the other. You have to determine which is the primary one and this is the one you want to treat first. If you have head trauma then it would always be treated first.
10. **How does mon-ocular diplopia occur?** This happens around edema when there is a scotoma or a detachment in the retina. As you are mapping the field and he reports seeing two dots on the end of the probe, place the pointer in one spot and use another dot and place it over the other one in his field. Mark well. In real life he will see 3 images if he can't fuse one of them.
11. **Your wife Rosemary claims that for years she went to bed with 2 men. Do you care to comment on that?** Yeah, that was me and Dr. Spitler. **You and Dr. Spitler???** That was Dr. Spitler's book "The Syntonic Principle", that I read every night. If you want to be good at syntonics you have to study!

Thank you, Charlie!

The Syntonic cases of Dr. Charlie Butts on Video



Charles Butts O.D., Ph.D., credits syntonics for a 90% success rate in over 3,500 documented cases. Learn his secrets. The VCR tape is \$25.00 plus \$6.05 shipping and handling to the College of Syntonic Optometry.

Visual Signs of Reduced Form Fields

By

Ellis Edelman, O.D.

I) Definition of **form field**. Represents a "comfort zone" dictated by the mind which actually determines just how much (volume) and for how long (cognitive time) the individual is comfortable and willing to process both sensory (incoming) information and motoric (output) responses.

II) Clinical Observations of Reduced Form Fields:

A-Objective Signs

1. Alpha-Omega Pupil
2. Brock String showing suppressions, alternating and tendency to "compress" the spatial volume.
3. Poor tracking ability with strong tendency to move the head in the direction of the moving target
4. Tendency for pupils to dilate during tracking and when measuring visual acuity at both near and distance.
5. Lowered ability to hold expected binocularity during convergence near point test with early report of diplopia usually followed by late recovery.
6. Lowered ability to sustain clear vision especially at near
7. Inability to maintain valid orientation to the task

B-Subjective Visual & Behavioral Characteristics Most Often Reported:

1. Skipping or repeating lines when reading
2. Difficulty copying from blackboard
3. Headaches and eyes hurting with near work
4. Avoidance to near work (oppositional behavior)
5. Above normal sensitivity to ordinary light levels
6. Tendency to hold work too close
7. Short attention time
8. Car sickness/motion sickness
9. Tendency to knock things over on desk or table
10. May tilt head to one side in order to center with one eye only
11. Day dreaming (one way of releasing stress)

CONCLUSIONS:

Many children and adults with undiagnosed and untreated visual-motor-perceptual dysfunctions should have a functional visual field test (motion and form fields) performed by a developmental optometrist. If reduced form fields are found it will help explain the many visual and behavioral characteristics seen among this group of individuals.

Summary of the Use of Syntonics in the Treatment of Learning Related Reading and Learning Problems

C.O.V.D Annual Conference, 2003

By

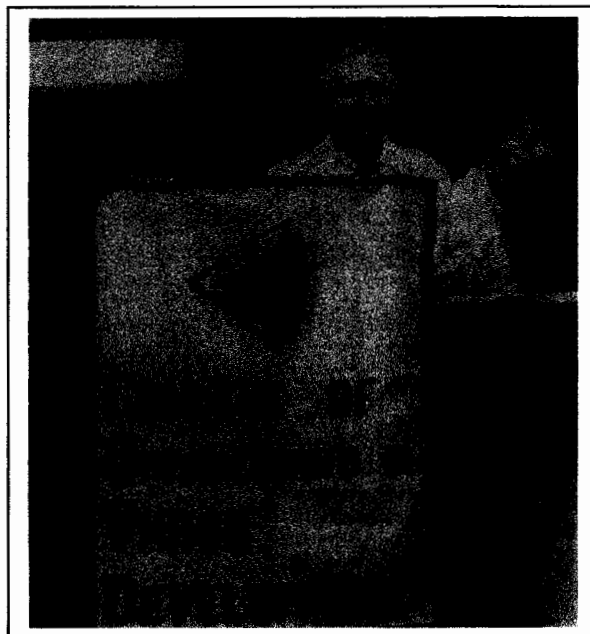
Larry Wallace O.D., F.C.S.O.

This presentation included a brief history and theoretical background of Syntonic phototherapy. Optometry has been involved in color therapy since the 1920's as demonstrated by the work of Henning, Kurtz, and H.R. Spitler, OD., M.D., the founder Syntonic Optometry. Spitler's work created the scientific basis for the ocular application of specific frequencies to treat a wide range of vision conditions. This included detailing the light effects on the retinal-hypothalamic pathway, frontal cortex, endocrine stimulation, ocular blood exposure, and perivascular transmission of electromagnetic energy. Color light frequencies have direct effects on cells' biochemical and electromagnetic environments, bodily health, ocular function, and emotional balance. This is accomplished is by balancing the Sympathetic-Parasympathetic nervous and endocrine systems.

The autonomic and endocrine systems have a major role in support of vision and can be brought into balance by light frequencies. Both systems stimulate or depress the action of smooth and striped muscles, pupil responses, accommodation, and visual field awareness.

Kinetic and color fields play a major role in visually related reading and learning problems. Both the magno and parvo cellular systems respond to color. Field constrictions and

enlargement of the physiological blind spot reduce visual informational processing and can be remedied by optometric phototherapy. The Ingersoll study also found that field expansion does not always initially improve reading without reading instruction.



Case selection for syntonic phototherapy relies on several criteria. A history for head trauma, ear infections, fever, and toxicity are especially significant. Pupil responses are used to gauge the balance of the autonomies. A key finding is an Alpha-Omega pupil: a pupil which will not sustain constriction under direct illumination, indicating adrenal and accommodative fatigue. The analytical reveals poor motility, reduced color vision, erratic phorias, a reduced ductions and recoveries. The visual fields

may show constrictions to motion, form, color, and enlarged blind spots.

These symptoms can be seen in the Syntonic Syndromes which allow easy case typing for Acute, Chronic, Lazy Eye, and Emotional Fatigue cases. Each case type responds to selective colors in most situations. Generally low frequencies such as red, yellow and orange are used to stimulate the sensory motor system and high frequencies of violet, indigo and blue depress the sensory motor systems. This also can correspond to low

frequencies activating sympathetic responses and high frequencies the parasympathetic nervous system.

Treatment involves viewing a selective color or color combination for 20 minutes, 3 to 5 times a week for 20 sessions. Progress evaluations are given every 6 visits where an analytical and visual field exam is completed. Visual fields are measured by kinetic targets with a campimeter or frequency doubling technology. Field improvement is critical to successful treatment.

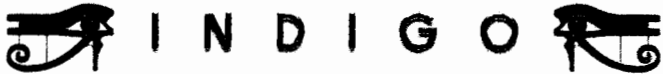
Field expansion, and normalization of enlarged blind spots from syntonics phototherapy, result in improved ocular motor skills as demonstrated by Visagraph readings on select patients.

For example, a patient with reduced kinetic fields, enlarged blind spot, and poor ocular motor skills had Visagraph readings of 313 fixations/100 words, regressions of 139/100 words, a span of .32 and a rate of comprehension of 69 words/minute. After 7 sessions of syntonics which resulted in a normalization of fields and blindspots, the Visagraph readings were 162 fixations/100 words, 38 regressions/100 words, a span of .62, and a rate of comprehension of 160 words/minute. Another case post syntonics revealed fixations of 504/100 words changed to 257, regressions of 185/100 words changed to 79, and the rate of comprehension went from 35 words/minute to 72 after 20 sessions of treatment. Visual field defects were normalized in this case as well. The ocular motor skills of each were greatly enhanced in each case with sytonic treatment only. Both cases revealed 100% improvement in reading performance as measured by the Visagraph. Patient subjective reports of reading improvement were superlative.

These results conform to sytonic theory in several ways. Visual field awareness and magno processing is essential to normal ocular motor skills. The peripheral processing acts as gyroscopic guidance system to saccades, pursuits and fixations. Reduced fields result in constricted and inaccurate movement skills. Reduced fields may reduce the span of awareness as well. Normal central-peripheral processing relationships require

balanced speed and sensitivity between both the magno and parvo systems. This also requires balance in the autonomic and endocrine systems. Enlarged blind spots also indicate a reduced speed and sensitivity in the photocurrent from the eye to the brain. Both binocular and accommodative function are essential to good reading and information processing.

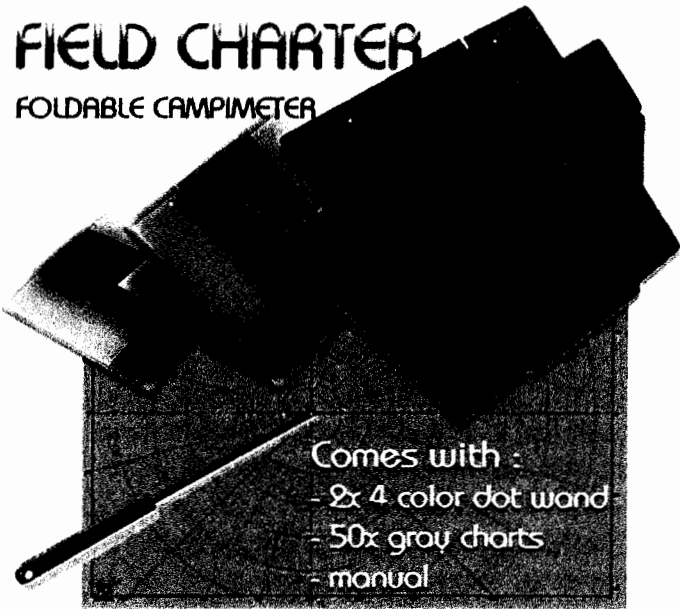
Syntonics views these neuro motor skills as a reflection of a balanced autonomic nervous systems and hormonal systems. When these systems are imbalanced, the symptoms are poor ocular-motor function. Sytonic phototherapy can be used with any visual therapy regimen to neurologically balance the patient and speed results and success. Visual field measurement is crucial to a complete visual analysis and defects can be efficiently treated with syntonics. This can result in significant improvement in reading and information processing.



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A SYNTONIC CASE STUDY

By
Dr. Betsy Hancock

I first met Ruthie during a routine examination in July of 2003, she is a petite five year old white female currently in kindergarten and learning to read. Her mother was concerned she was holding her book "too close." Upon further questioning, the book became blurry and headaches occurred after a short period of reading and possible diplopia existed. When Mom asked if she read two "the"s because she saw two "the"s, Ruthie indignantly replied of course I see two "the"s. It was very clear from her remark she would not consider doing anything differently. Mom then inquired if this is why the other office was unable to obtain a prescription for her. The answer to this question was resoundingly "yes." When a child has a constricted visual form field such as Ruthie's, a consistent refraction will be near impossible and unstable as the visual processing system is unstable due to the severely constricted visual form field.

Ruthie's medical history was unremarkable except for an allergy to Sulfa and a broken right arm in January of the previous year. Her entering unaided acuities were 20/20 in each eye at distance and near. Pursuits and Saccades were Grade 1. These are two initial tests done with Wolfe wands which quickly reveal tracking problems. A Grade 1 in Pursuits and Saccades will be accompanied by head movements. With the Pursuits, she moved her head and not her eyes to follow the ball. With the Saccades, the patient will often move the head directly in front of the ball as you move the ball and sometimes overshoot or undershoot the target observed. If the system is extremely unstable, an undershoot and overshoot of the target is observed.

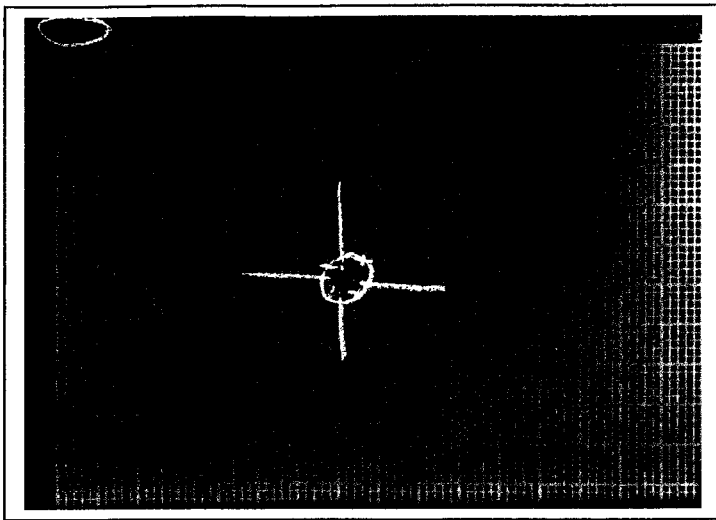
This very low level of tracking indicates an extremely constricted visual form field of approximately ten degrees. Now look for an alpha -

omega pupil which is a more direct estimation of the field. In Ruthie's case, an alpha -omega pupil was present. Her normal pupil size was five millimeters in each eye. When using the penlight, the pupils both quickly constricted and quickly enlarged to seven millimeters. Note that both pupils followed a similar pattern of constriction and enlargement, this indicates a similar visual form field in each eye. The quickness of the movement and the final size of the pupil indicates a field often degrees.

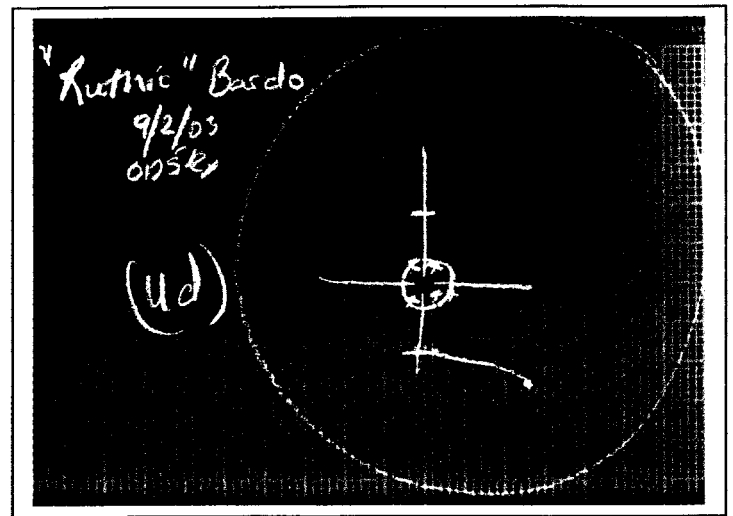
Between testing the eye movements and watching the alpha-omega pupil, which are quickly done as entrance tests, it is apparent Ruthie has a constricted visual form field. Compare your observations with the actual visual form field and learn to estimate based on these two simple entrance tests. This information is very helpful with younger or nonverbal patients and allows you to access the progress of any performance lens work done in the office.

Next a Convergence to Near Point (CNP) test was performed. Ruthie saw the target break apart into two wolf balls at eight inches and recover into one ball at ten inches. This may be written 8"/10", indicating the break and recovery measurements. This finding indicates a longstanding Convergence problem, of which the constricted visual form field is bottom of the problem. Treat the constricted visual form field first and the remaining visual problems are easier and quicker to train.

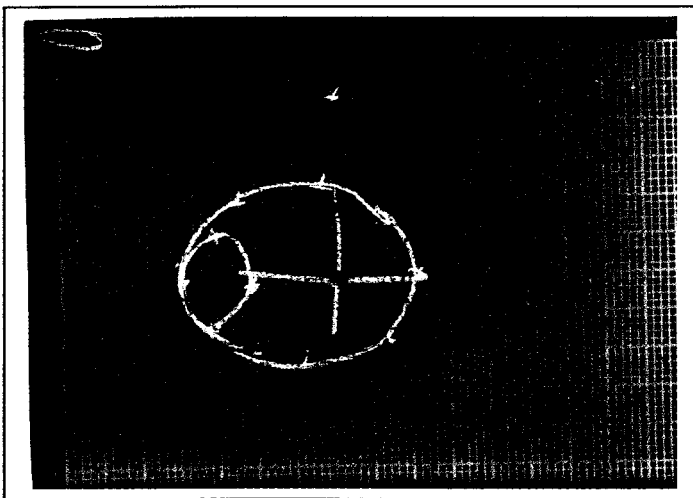
During this routine examination, a prescription was not determined. The patient was dilated and her ocular health was found to be normal. She was referred back to the office for a therapy evaluation.



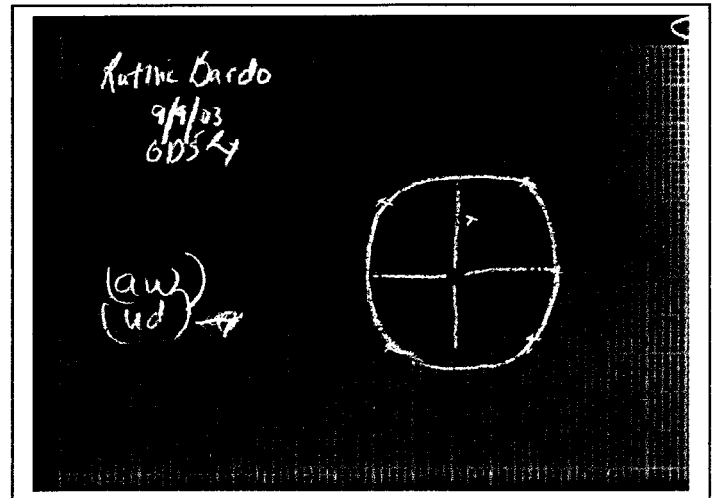
Left Eye- 9 / 2 / 03



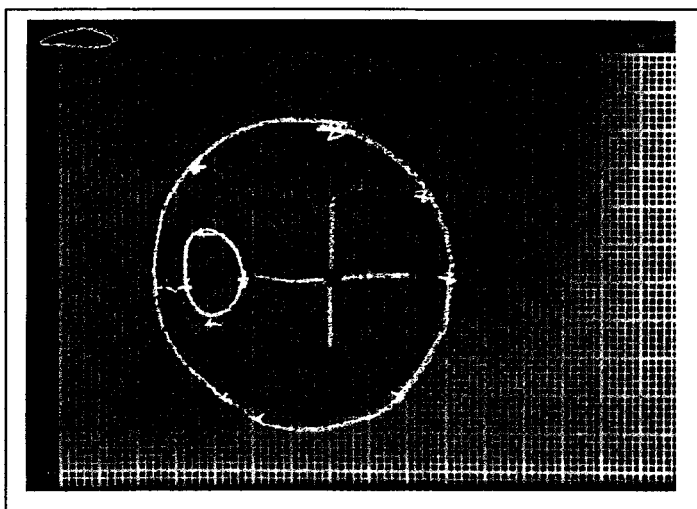
Right Eye- 9 / 2 / 03



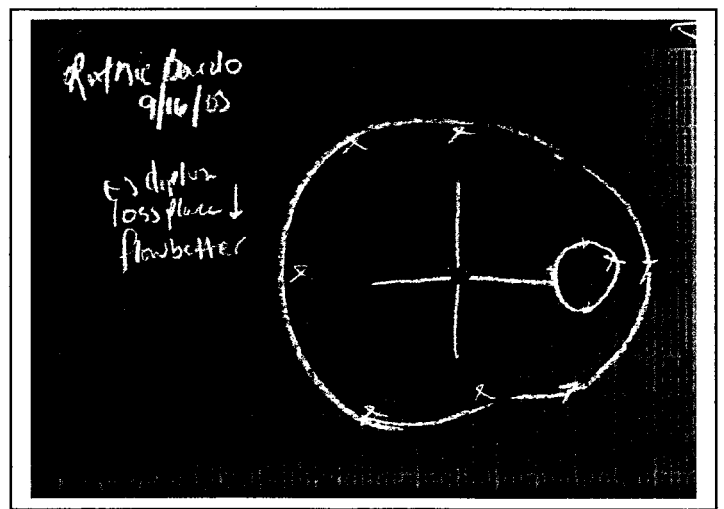
Left Eye- 9 / 9 / 03



Right Eye- 9 / 9 / 03



Left Eye- 9 / 16 / 03



Right Eye- 9 / 16 / 03

Ruthie returned in early September for her therapy evaluation. With the parent already knowledgeable about the visual processing dysfunction, the examination starts with the visual form field. All fields are marked with a white plus and a red dot in the center of the field. This approach is from Dr. June Robertson, a long time syntonist and past College of Syntonic President. The red dot is particularly useful with a small child and can become a game to help obtain better results. After showing the white wand to the child, ask them to keep an eye on Mr. Red Dot. Explain he is hungry because he did not eat his breakfast or lunch and he wants to eat Mr. White dot or the target. At first, a motion field is obtained and it is explained to the parent, this is the area they first pick up movement. I then have them say now, yes or even raise their hand. This can become a very exciting game from Dr. Charlie Butts, Dean Emeritus of the College of Syntonic Optometry.

First a motion field is obtained by asking the child when they observe movement. Explain to the parent this is the area which your child has to observe movement. The entire color field will also enlarge at least this much. Ruthie's motion field was twenty degrees. Next, the white target is used as the beginning of the color field sequence. Her white field in the right eye was eight degrees and the blue, red, and green fields were all one degree or on the red dot. The left eye was similar in that the white field was eight degrees and all color fields were on the red dot. The color field represents the actual area the child has to think in. It is helpful to show and reproduce actual series of fields enlarging and reminding the child and parent this constricted field is at the bottom of the visual processing problem and is treatable.

Generally, Saccades and Pursuits are repeated to show the parent how the field affects the tracking. Ruthie's cover test was variable from 8 exophoria to 8 esophoria. Her stereopsis, with the Stereo Fly was normal, the Randot was not present and the Titmus was present up to the last set of circles with the left eye intermittently suppressing.

Her near lateral phoria was one and a half

esophoria and the near lateral phoria was one right hyperphoria. Her Base In Distance Vergences were X/12/0 and Base Out were X/14/0. Her Near Lateral Phoria was two esophoria with one right hyperphoria. Her near Base In Vergences were X/22/0 and the target moved to the right with Base Out Vergences. With a ± 1.00 lens her Near Vertical Phoria was three exophoria and orthophoria. With the near lens the vergence findings were diplopia.

Ruthie's amplitude of accommodation was 2 Diopters in the right eye and 3 Diopters in the left eye. With the Monocular accommodative Facility, she was only able to pass one cycle before fatiguing in both lenses. In the left eye, she easily passed the test. Please read further on this in the College's Blue Book under Syntonic Syndromes "The Chronic Syndrome" by Dr. Larry Wallace.

Her Humphrey Test, using the Doubling Technology, revealed reliable central and peripheral losses in the right eye and unreliable central and peripheral losses in the left eye. She reported becoming tired during the left eye testing.

From her field and examination results, we see that Ruthie has a chronic, longstanding, under active visual processing system. Our first goal is to enlarge her very constricted visual form field to begin the normalization of her visual processing system. The most effective color/frequency is to start with one of the green frequencies and since the system is chronic, requires stimulation and we need to move towards exophoria and away from esophoria, the choice is Mudelta or yellow green. The kinesthetic testing also agreed with this color.

Ruthie's parents elected to do her syntonics at home and she returned one week later for another visual field test. It is important to monitor the results of the Syntonic treatment with in a week of home therapy or after six sessions of in office treatment. Think of the treatment as an experiment When looking at the field change-the chosen Frequency has created this much change in the system and what does the patient need next? The second visual field revealed a full twenty degrees in her right eye with the colors just under the white

field. The left eye now includes a slightly enlarged blind spot making the field size thirty degrees horizontal and 20 degrees vertical. This is a very encouraging improvement after a week of treatment, with only twelve sessions.

the treatment now requires going further out on the limb in the sympathetic direction as the field is now enlarging and becoming established. Particularly since the left field has enlarged past the blind spot. The next choice of sets of frequencies would be alpha-omega or ruby or alpha-delta or orange being the strongest stimulant of the two. Alpha-omega is the emotional stabilizer and combines with mudelta to the filters which Dr. Butts calls the miracle workers. This filter also tested kinesthetically as the preferred choice for the first set of filters for ten minutes. This is followed by mudelta again to continue enlarging and bring the patient back to balance at the end of each twenty minute session.

Ruthie returned in a week for her third visual field and her field continued to enlarge after six home therapy treatment sessions. The right eye shows an oval forty by fifty degree field with a normal blind spot and the left eye now shows a slightly enlarged blind spot. Ruthie reported she was no longer experiencing double vision or losing her place while reading. Her mother felt her reading flowed better.

It is my clinical impression that the majority of patients which test on the sympatric side also need some alpha-delta. This frequency seem to resolve issues around eccentric fixation, focusing and acuity. Sometimes this color will kinesthetically test before alpha-omega or as the only color with mudelta. Ruthie's treatment program changed to

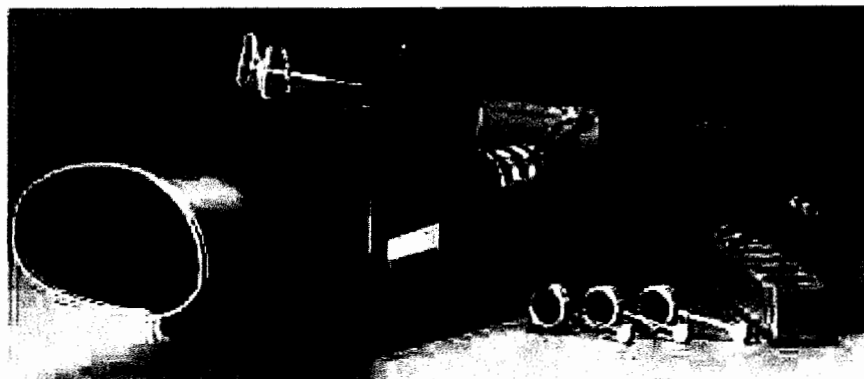
alpha delta for 10 minutes followed by mudelta for 10 minutes for a total of 20 minutes. Ruthie then did approximately 12 sessions of the above treatment and then waited one week for the reevaluation.

At the reevaluation, the field was fifty degrees in the right eye and sixty degrees in the left eye. Her Humphries' field was redone and although the right eye was valid the central area remains problematic and the periphery has improved surrounding the central area. The left eye remains invalid as far as maintaining the fixation point although it is much lighter throughout the field.

The rest of the reevaluation testing revealed improved findings throughout the testing. Saccades improved to a grade plus and Pursuits improved to grade three. Clinically, there appears to be a direct correlation between ocular motor skills and the size of the field. The larger the field the better the tracking. The cover test is now a stable orthophoria without the previous swinging. In addition, the depth perception improved and the suppression stabilized. The near lateral phoria improved to one exophoria and five exophoria with the plus one gradient. A plus 0.62 reading lens was prescribed for reading in part based on this finding. With the near vergence, there are ranges in with Base in and Base out with and without the gradient. The vergence ranges are not expected to be completely normal at this point. Ruthie's vergences have significantly stabilized and are now very easy to further develop in the training room.

Ruthie then received 12 in office therapy sessions with her final near base out vergence ranges being X/40/ 10. Ruthie and her parents were pleased that her reading was less frustrating and easier.

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Antwerp, Belgium.

In November 2003 members of the light society gathered in Antwerp to discuss their future, the conference was called Light Medicine 2003.

The background of Light Medicine 2003 was a yearlong dream for many. The planning began as early as in November 2002 when Pierre Van Obberghen gave a course in Oslo.

The meeting at the Horta Hall should be seen as a "United Nations of Light Therapy." It's the first time such a diverse and important group of specialists have been brought together. There is an extraordinary amount of expertise present at the conference, along with a profound amount of wisdom. Researchers, therapists, authors and product merchants – some have struggled for 20 years and more to get the message through.

In previous meetings, time has been spent on networking and teaching, but this time it should be different, this conference is meant for work.

"This is a time for inspiration and hard work, considerable steps should be taken, and light by its nature is democratic."
Brian Breiling

Dr. Edwin D. Babbitt

The Principles of Color and Light and the Chromolume

By
Chris Terrell

Color plays an important role not only for our pleasure but also in our health. The history of healing with color is extensive and most impressive, but it was not until the latter part of the 19th century that Dr. Edwin D. Babbitt wrote the book *The Principles of Light and Color*.¹ Written in 1878, it had an astounding impact in the medical circles and established Babbitt as one of the miracle men of his day and for many decades to follow.² His work was the first major contribution in modern times and has become a masterpiece in the literature of color therapy. His contribution has allowed a better understanding of the scientific principles of color application and their therapeutic effect on the human body.³

Dr. Babbitt developed a system of color applications based on spectrum analysis and the use of complimentary colors. He found each color of the spectrum had attraction and repulsion properties, much like magnetism, and that each color had an attraction for its opposite and repulsion to the color of its likeness. While a chemical affinity brings electrical and thermal substances together, chemical repulsion similarly causes colored elements to repel and stimulate each other. Thus a red light stimulates a red principle, like arterial blood; yellow light with some orange and red, stimulates the nerves; and blue cools the arterial and intensifies the bluish venous blood. These actions help balance extreme or one-sided conditions by bringing a contrasting color or substance, while chemical repulsion helps kindle into greater activity any part that is deficient in intensity.¹

With the use of the newly discovered spectroscope, Dr. Babbitt found the following colors to be complimentary:

Thermal (invisible) with Blue-Green

Red with Blue

Red with Indigo-Blue

Orange with Indigo

Yellow-Orange with Violet-Indigo

Yellow with Violet

Yellow-Green with Dark Violet

Medicating By Light

Babbitt ascertained that a person's condition determined the need for either thermal (warm) colors or electrical (cool) colors. To restore health and vitality to the body, cells would absorb those colors it was in need of (the complimentary color) and repel those colors it had too much of already. Given the fact that *sunlight* comprised the *full* spectrum of color, he determined it was the purest source of light for color healing. The sun gave off immense heat that produced metals, compounds, and gases. When Babbitt and other experimental scientists examined these gases under the spectroscope, the following metals were found: Sodium, calcium, barium, magnesium, iron, chromium, nickel, copper, zinc, strontium, cadmium, cobalt, hydrogen (gas), manganese, aluminum, titanium, rubidium.

In the usual eloquent and passionate voice of Babbitt:¹

We can no longer consider light as merely consisting of infinitesimal particles or waves; we may now conclude that it is metallic; that sunshine consists of a metallic shower; the

beneficent sunshine bathes us with elementary metals . . . which can thus float in sunbeams, incomparably finer than that which lies in hard masses in the darkness of the soil.

It is common knowledge that most medicines and vitamins of today are still extracted from plants that take nourishment, i.e., minerals and elements, through the root or the leaf and are dependent upon *sunlight*. Perhaps we can sympathize and even agree with Babbitt that while herbs and vitamins are healing, the possibility that specific color filtered through the sunlight could have even greater healing abilities.

Eventually Dr. Babbitt developed a therapeutic healing device he named the *Chromolume*, a beautiful six foot tall stained glass window built on principles of complimentary color healing. The window was usually placed in a southern exposure and would draw sunlight down upon the entire person. The patient could either lie down or sit in a chair. For specific ailments, the patient would take a position in front of the *Chromolume* and using a cord attached to the top of the window, would let the window slant in order to allow sunlight to pass through the correct color onto a

particular part of the body. A hook at the bottom beside the window could secure the cord.

Therapeutic benefits of each complementary color selection and placement of glass were enhanced due to the mineral and compound elements used in making specific glass. For instance, there were two kinds of red glass, the more common colored by the presence of copper, and a rarer and more beautiful sort, in which finely divided gold particles were added to make a deep crimson red. Green glass contained numerous brilliant crystals of metallic copper. Canary glass contained uranium and the purple hue owed itself to the manganese compound present.² These elements are some of the same fundamental elements found in sunlight and the human body. When sunlight passes through the glass, each color emits specific mineral properties that can be absorbed into the body through the skin. Thus, the patient would receive the powerful healing benefits from both the sunlight and the minerals and elements filtered through colored glass. The *Chromolume* could be used as a magnificent tool to tone and bring balance to the entire body.

REFERENCES

1. Babbitt, Edwin D. *The Principles of Light and Color*. New York: Babbitt & Co. 1878.
2. Burroughs, Stanley. *Healing for the Age of Enlightenment*. Hawaii: Kailua, 1976.
3. Babbitt, E.D. "Chromo-Therapeutics." *Color Healing: 21 Works of the Leading Practitioners of Chromotherapy*. California: Mokelumne Hill. 1956. 1-16.



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The History of the Syntonizer

By
Rex Cross

I moved to North Platte, Nebraska, in August of 1968 as an Instructor of Machine Tool at Mid Plains Community College. April 15, 1969, I joined North Platte Kiwanis Club. J. O. Jenkins was a member of the club also. J.O. and another Kiwanian were known for their inter clubbing and shortly after joining he talked me into going on an interclub. Four members visiting another club at their meeting was considered an interclub. It was through Kiwanis that I became well acquainted with J. O. J. O. was an optometrist at that time and very active in Kiwanis. J. O. was always visiting with us as we traveled and telling us of the patients he had helped with syntonics in his practice.

Several years passed and he enrolled in the night class that I taught in beginning Machine Tool. soon after he enrolled he purchased a lathe and set it up in his garage. One day he came and asked me if I could change one of the original instruments so that the filters could be dropped in from the top in slots in individual holders. I told him that changing the tube would not be any big problem so I started changing them for him. After he ran out of the old instruments that he had picked up from retired optometrists he started talking about getting the patterns and getting the parts cast. I do not remember how he came up with the patterns for casting the parts for the instrument. The pattern for the tube was modified and he started asking about foundries. I mentioned the names of several in Omaha, Hastings and Lincoln. He finally found a foundry in Omaha to cast the aluminum and brass parts. the cast iron base was cast by a foundry in Hastings. He asked me how are we going to machine the casting so I helped him make setups so he could do the machine work in his garage. One day when I was helping him get castings ready he asked me what ideas I had for a

campimeter. He showed me a picture of one that he had used in his practice so we set out again on designing and building what we called a field charter. The first field charter is different from the one that I manufacture today but with the same principle ideas. The targets were J.O.'s idea and I changed to different materials than first used. About this time the college administration pushed me out the door and J. O. sold all his equipment for practicing and the business.

Since I enjoyed machine work and had skills in welding I purchased machine tools and leased them to the owner of the machine welding shop where I was employed during the day and worked on the instruments in the evenings and weekends. It was in the early 80's that J.O. asked me to help with the instruments and C & J Instruments was born. J.O. built the first power supplies using a variable transformer and a circuit for flashing. The parts for the power supplies kept increasing in price and then not manufactured so again another project of designing a power supply using integrated circuits replacing many of the components with a small chip.

The bulb used the early syntonics instrument was a vibration service bulb and is used today. May use what Charlie wrote about the bulb and voltage as he has a better explanation of why what was done about the bulb when J.O. started manufacturing the instruments in the 70's.

We have experienced the new standards set out by the Environmental Protection Agency more than once during the short time and in most instances closing the foundries because of the expense of conforming to the standards were too great for them to continue operating.

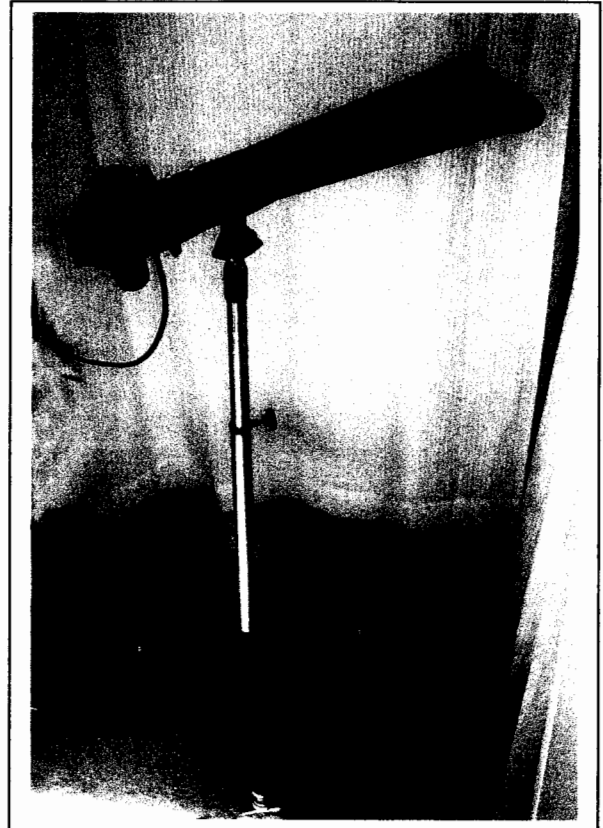
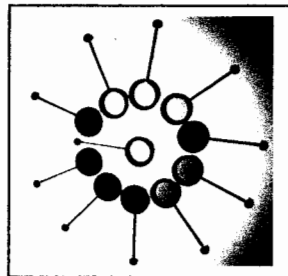
I purchased the business from J.O. in the early 90's.

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