Journal of Optometric Phototherapy

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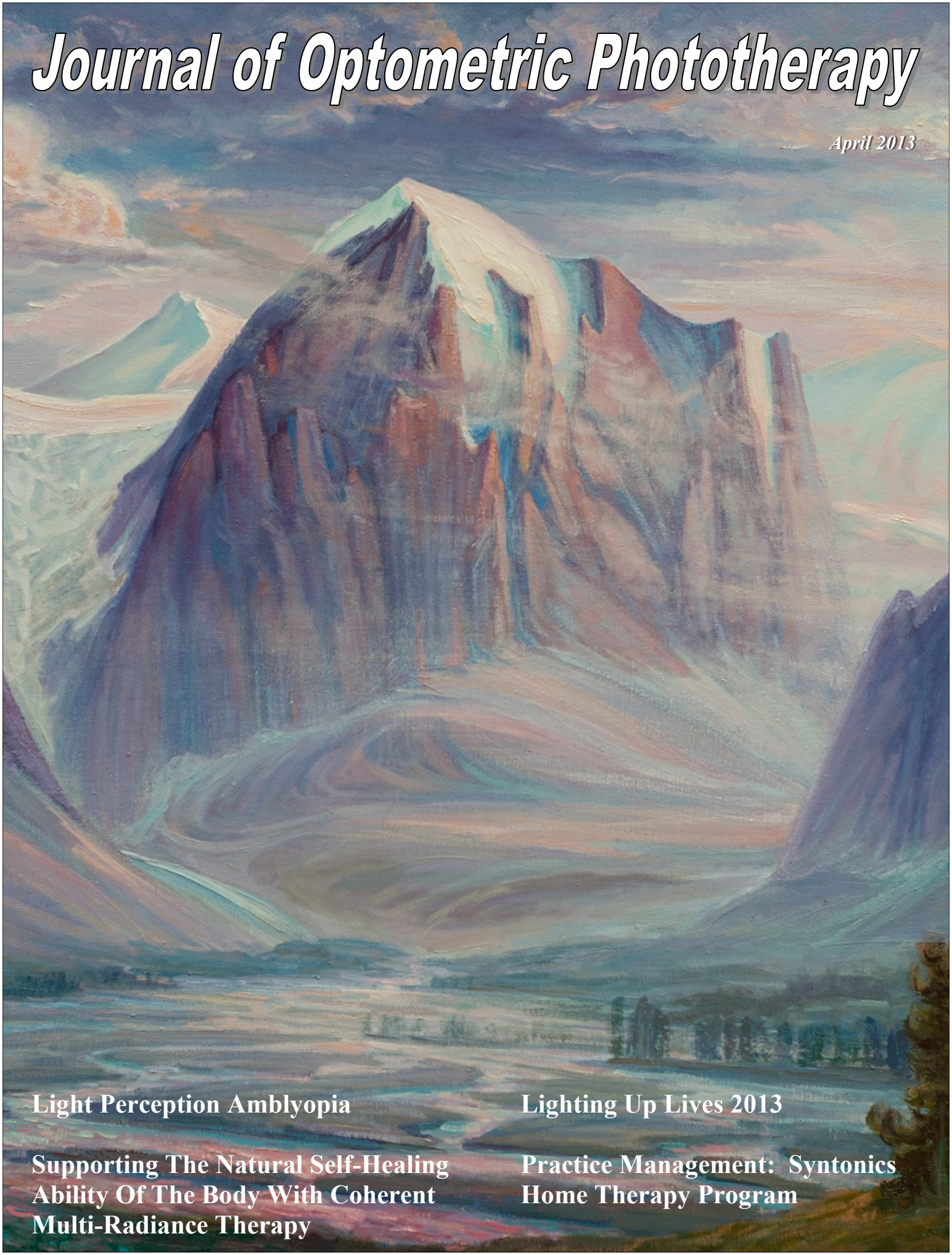

Light Perception Amblyopia

Supporting The Natural Self-Healing Ability Of The Body With Coherent Multi-Radiance Therapy

Lighting Up Lives 2013

Practice Management: Syntonics Home Therapy Program

College of Syntonic Optometry

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THE THERAPEUTIC APPLICATION OF LGHT TO THE VISUAL SYSTEM

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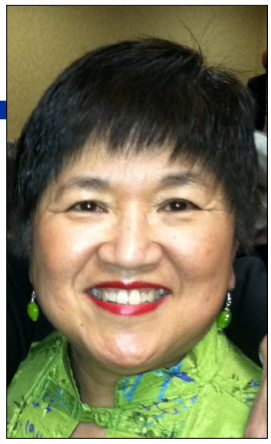

Dear CSO Colleagues,

Back in 1973, just as I was leaving the US Army after my two year stint as a military optometrist along with my husband who had a low draft number at the time, I came across a saying on a Celestial Seasonings tea box that said, **"May the work you do be the play you love."** It really grabbed my attention as that was exactly what I wanted to do when I left the Army, have inspiring, fun, meaningful work that seemed more like play!

Well, I was blessed to have just that…neurodevelopmental optometry that includes optometric syntonic phototherapy! It was in the late 1980s that I came across syntonic phototherapy while attending an OEP regional clinical seminar on brain trauma and its visual consequences. In bemoaning my frustrations with treating a retired Purdue aeronautical engineering professor with vertical diplopia following a stroke, some optometrist overhearing my complaints said he easily took care of vertical diplopia in two weeks or so! Amazed, I asked how! He said, "Why I syntonize them! Don't you have a syntonizer? What's wrong with you?!"

That began my fortuitous journey seeking information about Syntonics. Now, remember, not only was Optometry the stepchild of the medical community but optometric vision therapy was its ultra stepchild! We were the " blackbox" specialty of optometry! How in the world was I to retain respect and credibility if I brought what looked to me like some antique from the optometric museum into my vision therapy clinic?

Well, there's always strength in numbers! So, I began to look up practitioners from the CSO Directory and looked at their professional credentials. One such OD was the current president of the Iowa Optometric Association. En route to a Williams Marketing seminar in Nebraska, my husband and I stopped off at Dr. Hanson's office to take our first look at a syntonizer and visual fields tester. It was worse than what I had seen in pictures! Dr. Hanson's unit had a wheel attached to the body of the syntonizer with colored filters in it. It reminded me of the colored light wheel that used to shine onto the once popular aluminum Christmas trees of days long gone by! No way was I going to purchase something that looked like that! However, Dr. Hanson went on to show us some of his functional visual field studies. The before and after field charts were quite impressive but more importantly, visual field charts were familiar and optometric. Even his visual field tester looked familiar, like a stereocampimeter from my Optometry lab days! Even more convincing, insurance companies reimbursed him for the field studies! A small window of interest opened for us.

I continued to quiz various syntonic practitioners about their use of the syntonizer and the types of cases they treated as well as their success. Little by little, the idea of syntonics was seeming more credible and worth a trip to an annual conference.

Despite the unfamiliarity with all the Greek letters for the filters and the frustration with trying to understand the various lectures, the fact that so many PhDs were speaking at the conference and so many respected optometrists from not only the US but around the globe were in attendance definitely impressed me!

Back home with a "loaner" syntonizer that was purchased used by a very lucky lady OD from an Indian reservation for $30.00, (she couldn't use the instrument for a year because her optometry clinic wasn't completed yet and she graciously loaned it to me) I set out to see what results I would get.

Much to my amazement, small functional visual fields opened up! Autistic spectrum disorder patients became calm and interacted with their environment much more appropriately! Even my bewildered vision therapists began to insist we start with syntonics before they began the vision therapy session because the patients were more alert and cooperative during the therapy session!

And now, I find myself the President of this fine organization, the College of Syntonic Optometry! Ironic, isn't it?

So, why did I go to such lengths to share this story with you? Because as I travel to various optometric conferences and encounter colleagues who quiz me about syntonics, I know exactly what they are thinking! How in the world does Syntonics fit into my VT practice? How do you convince patients of its validity? Do you REALLY get results? What do your general optometric colleagues think about this?

My answer is Syntonics is just another tool in our optometric toolbox…a very effective, non-invasive, and gentle modality to boot! Bottom line, patients gain greater benefits from this treatment and it enhances the outcome of their therapy program.

Next, I encourage them to attend a CSO annual meeting to meet other syntonists and pick their brains. I also encourage them to attend the CSO 101 course to learn not only the history and validity of phototherapy but how to put their knowledge to use on Day One when they return to their office.

So, the saying on that prophetic tea box was right! I have lots more toys to play with after adding Optometric Syntonic Phototherapy to my list of "goodies"! I encourage each of you to go out and share your "toys" with your optometric colleagues for the betterment of our profession and most importantly, our patients!

~ Mary VanHoy, O.D., FCOVD, FCSO

Light Perception Amblyopia

John Downing, O.D., Ph.D., FCSO

For almost a century optometrists have been using light therapy to treat depressed, constricted visual fields. A generally depressed visual field represents a decrease in light perception across the entire visual field. It can be detected by a visual field test because there are fewer cones in the periphery of the retina so the threshold of "non seeing" appears in the periphery first. As the visual depression increases the visual field progressively constricts.[1]

An estimated sixty percent of all nerve fibers going to the brain originate in the eyes and their connections extend throughout the brain. This visual light perception flowing through the brain is vital to our health. It brings sight to the brain, gives the brain energy to function properly, influences brain wave patterns, and regulates much of the neuroendocrine activity of the brain and body.[2,3,4,5,6,7]

A depressed visual field represents a decrease in light perception to the brain, creating a light perception deficiency which is a visual impairment to proper eye-brain functioning. Conditions associated with the impairment of vision without any detectable organic lesion are classified as an amblyopia. Most amblyopias are relatively rare, such as toxic amblyopia and strabismic amblyopia. However almost everyone has some degree of light perception deficiency as a result of numerous head traumas and illnesses experienced throughout their lives. This makes "Light Perception Amblyopia" by far the most prevalent form of amblyopia.[1,6,7,8]

The term "Light Perception Deficiency" or "Light Perception Amblyopia" medically classifies the general depression of a visual field into a condition that is more descriptive of its deeper impact on brain function. It provides a better understanding that a visual field constriction is the indicator of a broader visual impairment that is keeping the brain from getting enough visual light energy to function properly.[6,7]

"Light Perception Amblyopia" can cause or exacerbate problems that range from localized ocular problems to vision pathway problems deeper within the brain. These problems can include brain fog, learning, memory and speech disabilities, ADHD, fatigue, depression, SAD, headaches, insomnia, PTSD, color blindness and many other disabilities.[2,3,4,5,6,7]

This nomenclature is in alignment with standard insurance requirements. The appropriate diagnosis code is listed as unspecified amblyopia, "amblyopia ICD-368.00". The appropriate procedure code is listed as "orthoptic/pleoptic training CPT-92065". This procedure code is the customary code used for all vision therapy, including light therapy. However, since Bangerter introduced the term "pleoptics" to include all forms of treatment for amblyopia, this procedure code becomes even more relevant for the use of light therapy in the treatment of "Light Perception Amblyopia".[8]

NOTE: At the upcoming International Conference on Light and Vision, Dr. Downing will provide more detail on this subject during his presentation, "How Light Therapy Improves The Brain".

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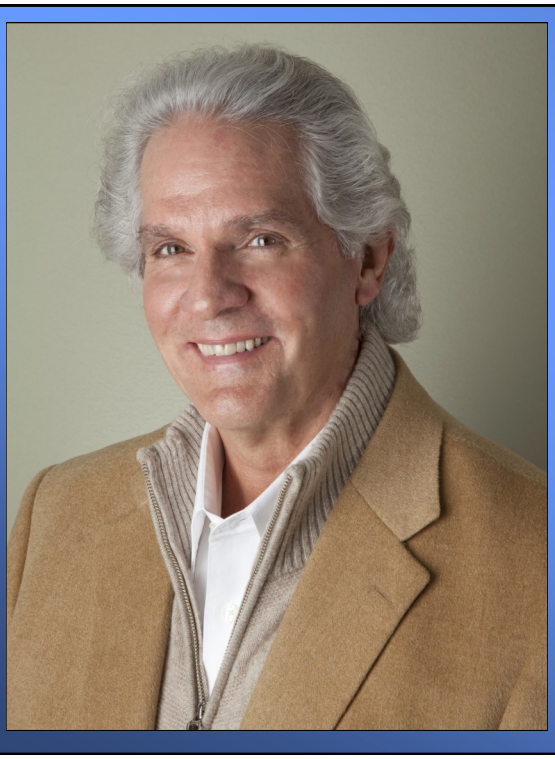

About the Author:

John Downing, O.D., Ph.D. has had a lifelong fascination with light and physics and has practiced light therapy for almost forty years. His major interest is in the treatment of patients with "Light Perception Amblyopia".

While staying within the scope of optometry, he has expanded light therapy protocol to be able to diagnose and determine light therapy prescriptions to help patients with a broad range of eye-brain problems.

Dr. Downing has taught his light therapy protocol to practitioners throughout the United States, Europe and South America. He has been awarded patents for the development of the Lumatron Light Stimulator and several other inventions in the fields of neuroscience and orthopedics.

He lives in the Northern California wine country where his holistic optometric practice focuses on "Brain Care with Light Therapy".

Supporting The Natural Self-Healing Ability Of The Body With Coherent Multi-Radiance Therapy

Dr. Arzhan Surazakov, Ph.D.

I often watched as my father, a professional artist, would become inspired by the play of colours in nature. Rich and strong, or subtle and whispering, the emotional impetus echoed in me whenever I looked at his paintings. Later, when I was working as a research scientist, I studied how colours in nature carried information about the health of a tree or the mineral content of rocks. But it was only after I started my research with Coherent Multi-Radiance Therapy (coMra-Therapy) that I came to a deeper understanding of colour as a universal language, and its ability to connect not only people, but even vastly different types of intelligence: for example, human thought, emotion and even the innate "instincts" of cells that make up our body. In coMra-Therapy we use colour in concert with near infrared laser light, a magnetic field and ultrasound, and all four of these components are held together by the central idea of cooperating with the body in the healing process.

COOPERATING WITH THE CELLULAR INTELLIGENCE

In the search for medical cures during the last century we saw stunning scientific discoveries in physiology, cellular biology and biochemistry. These step by step revealed how the whole operates, based on the properties of its individual parts: body – body systems – organs – cells – molecules. This so-called reductionist approach led to many advances in allopathic medicine in the 20th century, mostly in the areas of pharmacological therapy and surgery. But now we are faced with overwhelming mountains of data on molecular, genetic and signaling processes, and this escalating complexity prevents us from understanding even the simplest forms of life [1]. Moreover, researchers who work on the cutting edge of biological sciences are well aware and acknowledge that we are hard up against the so-called "emergent" properties of cells; that is when a whole cannot be reduced to the simpler properties of its parts. We seem to have reached a stalemate: if all our hopes of health and wellbeing are pinned to multi-billion dollar research programs aimed at deciphering the complexity of the body, why do they inevitably lead to more expensive but less and less effective healthcare? Is there a viable alternative?

Addressing the Needs of the Diseased Cells

Imagine if we approached the body, not as a chemical/mechanical automaton, but as a highly evolved and *intelligent* entity that not only knows best how to maintain homeostasis, but also knows how to heal itself after an injury. Accept the concept of the "Healer Within" as at least a working hypothesis. The aim of healing then shifts from fixing "broken" individual chemical processes, to finding ways of how to help the body in its task of self-healing. This aim is as old as the arts of healing themselves, but if we place it within the context of modern science, it instructs us to focus our medical research on studying how the needs of diseased cells can be met. We will now consider this in detail.

First of all, we know that in initiating a healing sequence the cells at the site of an injury engage in "conversation" through neural and chemical cross-talk. This involves a very large number of appropriate messages delivered to different types of cells that all play roles during different stages of healing. For example, in case of a skin wound, along with pain signals from sensory nerves the resident injured cells release proinflammatory messenger molecules that recruit immune cells to fight intruding pathogens [2]. Later, the inflammation has to stop and so then follows a tissue regeneration stage. Other types of messengers, such as Growth Factors, stimulate the proliferation, growth and maturation of young cells that will replace the damaged cells in the wound. But even the cell proliferation stage needs eventually to stop, in order to avoid excessive growth. The final stage of tissue remodeling allows functional normalization of the damaged tissue. Therefore, delivering proper messages to cells is a crucial component in any healing process. The question is how we can send such messages without disrupting the natural flow of chemical communication?

Following on from outlining the healing sequences, we need to consider the fact that the healing process requires energy. How do we feel when we get seriously sick or injured? Weakness and a desire to rest are the hallmarks of illness, because the body reroutes available energy to compensate for stress, operate the immune system and regenerate damaged cells. The energy crisis deepens even

further when illness or injury decreases the ability of a cell to replenish its energy stores of the ATP molecules, the universal fuel in the body. This can happen because of a lack of oxygen or supply of nutrients, (e.g. reduced blood supply), poisoning by toxic agents or damage to the energy-producing structures (e.g. mitochondria). Therefore, energy deficit is a common denominator in practically all diseases [2; 3] and by addressing the lack of energy in cells we would certainly help the body to recover faster.

Lastly, repairing injured cells involves restoring their structure through the synthesis and degradation of cellular building blocks. The speed of these processes, jointly known as metabolism, depends on many factors, but of particular importance are temperature and the speed of molecule transfer between different sites of chemical transformation. Both these factors can be increased by providing mechanical stimulus to cells.

NONINVASIVE STIMULATION OF THE HEALING PROCESS

We have considered several key challenges of diseased cells that can be addressed if we find therapies which avoid grossly invasive manipulation of the body's chemistry or mechanics. In this context the uses of a magnetic field, ultrasound, colour light and near infrared lasers are of great interest. These radiances have proven their therapeutic benefits and have developed into therapeutic modalities in their own right.

Phototherapy

Phototherapy is the application of light for healing. It is a well-established therapeutic modality: in 1903 already the Nobel prize for medicine was awarded to Finsen for his work on therapy with blue light. More than a century later we know much more about physiological responses to light of certain wavelengths (colours) and the photochemical and photobiological processes that are involved. Yet we can experience quickly for ourselves the effects of phototherapy by simply observing our emotional responses to colour. For example, the colour red excites and stimulates, whereas indigo-violet calms and relaxes. Closely following our emotional state are changes in our physiological responses: such as heart rate, breathing and muscle tone. Therefore, with careful observation one can match colours to certain physiological responses and then use this knowledge for healing purposes.

Naturally, the principles of phototherapy can be best demonstrated on the healing of eye-related diseases. In the 1920s Spitler pioneered syntonic optometry: the application of colour light directly to eyes to treat visual dysfunctions, head trauma, headaches, problems with learning and behavior [4; 5]. He collated his experiences with more than 3000 patients and formulated a set of guidelines that prescribe certain colour filters to normalize (syntonize) emotional, mental and visual disorders. Red and orange colours stimulate the sympathetic nervous system ("fight or flight" response). Indigo and blue colours activate the parasympathetic nervous system ("rest and digest" response). In the mid-section between these two opposites, the yellow-green colour promotes physiological balance. Pupil and visual field testing allow objective measurements of the healing progress. Syntonic optometry has stood the test of time and today is in active use worldwide.

Remarkably, a selective response to light colour was found not to be limited to specialized sensory nerves in the eye! It can be argued that in syntonic optometry the modulation of nervous and endocrine systems happens in the thalamic and hypothalamic regulatory centers of the brain, as a result of direct visual stimulus. But non visual nerves can also perceive and distinguish between different colour stimuli. In 1947 Arvanitaki and Chalazonitis reported how light directly excites or inhibits nerve firings, depending on the wavelength of light [6; 7]. Further research in this area has led to a whole new field of nerve stimulation with light [8; 9].

But to fully appreciate colour as a universal biological language we need to turn to the works of Karu, who from the 1980s has been experimentally proving that selective responses to different wavelengths of light is a common property of cells [10-12]. She applied light of different wavelengths (blue to near infrared) to mammalian cell cultures and demonstrated how their activity (rate of proliferation, synthesis of DNA) strongly depends on the exact wavelength (colour) of light. Moreover, and in addition to this, cells were shown to respond differently when colours were applied in sequences. For example, consecutive irradiation of blue (404 nm) and then red (633 nm) light synergetically stimulated cell response. A number of cell signaling processes were proposed to explain the observations [11; 13-16].

Low-Level Laser Therapy (LLLT)

A laser is a device that emits a highly coherent beam of light. Unlike with sunlight or light from incandescent lamps, photons of light in the laser beam travel through space in a highly synchronous and coherent way. This coherency emphasizes the energetic aspect of light. High-

power lasers for cutting are very well known in surgery, but very soon after the discovery of laser technology in the 1960s experiments with noninvasive low-level lasers showed unexpected beneficial effects on wound healing [17]. Over the next four decades laboratory experiments and randomized clinical trials established LLLT as a proven therapeutic modality in a wide range of diseases: for example, neck pain [18], low back pain [19], diabetic foot wounds [20], osteoarthritic knee pain [21], amblyopia or "lazy eye" [22] to name but a few. "The New Laser Therapy Handbook" published in 2010 by Tunér and Hode lists 130 randomized clinical trials, providing a level of evidence equal to or exceeding that of many drugs on the market today [23].

For anyone who is accustomed to the narrow scope of actions of drugs the therapeutic universality of lasers immediately raises questions about how it is possible to treat vastly different conditions with the same therapy? Yet experiments have clearly demonstrated lasers' normalizing effects on inflammation [24-26], regeneration of skin, muscle, bone and nervous tissue [27-31], growth of new blood vessels in wounds [32], rescue of neurons inactivated by toxins [33; 34], and stimulation of immune cells [35]. The search for a mechanism that could explain such different manifestations of LLLT led to the discovery that LLLT stimulates synthesis of the universal fuel of cells – the ATP molecule [36-39]. Near doubling in concentrations of ATP were detected after irradiation with near Infrared and red light in animal cells cultivated *in vitro* (in test tube). Later, *in vivo* (in living organism) experiments confirmed that near Infrared irradiation restored cortical ATP content after embolic stroke [40] and traumatic brain injury [41]. Providing cells with extra energy allows for a natural resolution of the disease, regardless of its type.

Magnetotherapy and Magneto-Infrared-Laser Therapy (MIL-Therapy)

Therapies using naturally-occurring magnetic materials have been known for centuries [42]. Modern day clinical evidence has confirmed the efficacy of magnetotherapy across areas as diverse as bone unification [43; 44], edema of soft tissues and pain relief [45-47].

In an interesting turn of events, similarities between some of the clinical effects of LLLT and magnetotherapy led to experiments with their combined application. In the late 1970s Russian scientists proposed the idea of Magneto-Infrared-Laser Therapy, (MIL-Therapy), and by the 1990s MIL-Therapy devices were introduced to clinical practice [48]. A combination of the two low-level radiances showed synergetic healing effects that exceeded those of the individual radiances. Over the past two decades the technology has proved to be so successful that it is now used in leading Russian medical institutes to treat more than 200 medical conditions across such fields as traumatology, infectious diseases, urology, dentistry, neurology, endocrinology, and many others [49-53]. Unfortunately, the clinical results are mostly published in Russian (see peer reviewed journal "Laser Medicine" at http://elibrary.ru/issues.asp?id=8801 and the thematic collection of papers cited above) and they are therefore not well known elsewhere.

How magnetotherapy works at a cellular level and especially the nature of its synergy with low-level lasers remained uncertain until very recently. The latest discoveries in isotope chemistry, however, have shown clearly that the key process of energy metabolism (ATP synthesis) can be stimulated by a magnetic field [54-56]. Therefore, we can see that it is possible to use both low-level lasers and a magnetic field to help cells suffering from energy deficit. And here we need to note that practically all types of cells can benefit from such stimulus; in humans, as well as in animals.

Ultrasound Therapy

Ultrasound is an acoustic pressure wave (>20 kHz) that passes through tissue as a train of compression and expansion zones creating vibration [57]. Therapeutic use of ultrasound has existed since 1927 [58] and in clinical practice ultrasound has been used for decades for accelerating bone repair [59-61] and wound healing [62; 63]. Experiments with low intensity ultrasound have shown effects similar to phototherapy, LLLT and magnetotherapy with respect to proliferation of cells [64], growth of new blood vessels after injury [65] and enhancement of blood circulation [66]. Many studies have compared ultrasound with LLLT in terms of the overall healing [67-69], but in the context of our discussion of coMra-Therapy we need to identify differences for, obviously, ultrasound acts very differently to low-level laser.

Ultrasound stimulates metabolism in the body through increases in molecular transport and temperature, thus speeding up processes of protein synthesis/degradation that are crucial for restoring damaged tissues [70; 71]. Specifically it has been suggested that ultrasound accelerates enzymatic activity [72]. In the body most chemical reactions are assisted by enzymes, the protein catalysts that bring together input molecules, allowing them to undergo chemical change and then the product is released from the enzyme. Ultrasound can increase the speed of

delivery of substrate to an enzyme's active site and also the subsequent dislodging of the product. For example, experiments of blood clot dissolution with ultrasound showed that the speed of noninvasive enzymatic degradation of the clot can increase from 2 to 5.5 times in the presence of ultrasound [73-75]. Besides the purely mechanical stimulation of enzymatic activity, ultrasonic energy is eventually absorbed in tissue and this very slight heating also increases the rate of biochemical reactions [71; 76].

PUTTING IT ALL TOGETHER

We have considered experimental and clinical evidence concerning the four therapeutic radiances. When applied at optimum doses, including wavelengths (frequencies), with modulation/pulsing and other parameters, all of these radiances have been shown to be therapeutically effective. The absence of negative side effects is typical with these low-level therapies. And all of these therapies to different degrees have shown beneficial effects on cell proliferation, inflammation, pain relief and immunity to disease, in cases with very different underlying pathologies. Realization of these facts has led to a large number of comparative experiments, clinical trials and systematic reviews indicating the best modality for a certain condition [21; 77-79]. But could these radiances be grouped together to support the healing process?

Obviously the four radiances operate according to different physical/chemical bases. Incoherent and coherent light, magnetism and ultrasound are very different types of radiant energy. But in the analysis I presented above, I showed how the four radiances play their specialized roles in three crucial aspects underlying the *natural* way of resolving a disease at a cellular level (Figure 1):

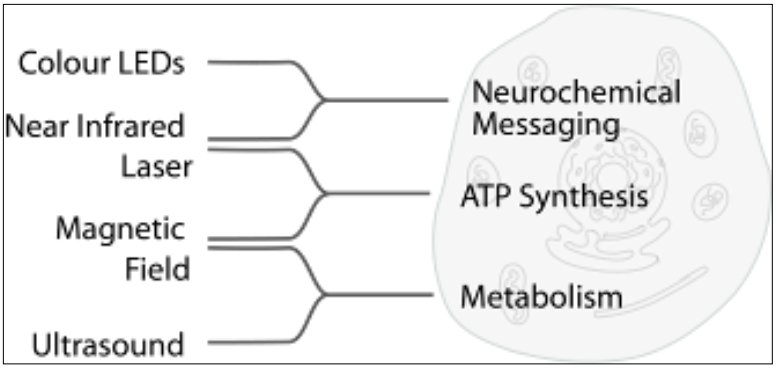

Figure 1. The roles and synergy of the four radiances of coMra-Therapy in supporting three aspects of healing.

Note that these vital and tightly connected aspects do not compete against each other! Instead, if stimulated *coherently* they result in the emergence of a synergetic healing effect: the whole is greater than the sum of its parts. The opposite is equally true: if we stimulate only some of these aspects, the overall healing process will still benefit, but *only* up to the limits imposed by the slowest process. These principles of holism are the cornerstone of Coherent Multi-Radiance Therapy.

FEATURES OF COMRA-THERAPY

The concept of coMra-Therapy, which included the blueprint for combining the four therapeutic radiances, and the main parameters of operation, came about following an intuitive discovery, specifically, a dream. Based on the information in the dream, we at Radiant Life Technologies continued the practical development of coMra-Therapy and the Delta Laser by assimilating the more esoteric principles of colour and intuition and combining these with principles of medical science, together with a knowledge of healing, and clinical experiences of the individual radiances, including those of MIL-Therapy.

Near Infrared Laser and Magnetic Field

Near infrared laser is the central component of coMra-Therapy. It provides energetic stimulus for the whole healing process. A selection of two laser diodes are used in coMra-Therapy (905 or 980nm) at 10 mW radiant power. (The 905nm laser is available to practitioners on special order). Light at both these wavelengths has superior penetration abilities in tissue, since at longer wavelengths light is more absorbed by water and at shorter wavelengths light is absorbed by skin pigments and hemoglobin [80]. With this laser light direct stimulation of ATP synthesis is possible in diseased tissues, even deep in the body (up to 5 cm [81]).

The strength of the static magnetic field in coMra-Therapy is 30 mT, although this varies due to spatial gradient and shape of the magnetic field. The magnetic field strongly enhances the effects of the laser, making the commonly-used higher doses of irradiation in LLLT unnecessary. Friedmann et al experimentally demonstrated that a weak magnetic field increased the effect of the infrared laser by an order of magnitude [82].

Sequenced Colour LEDs

The light from colour Light Emitting Diodes (LEDs) is fully absorbed by the skin, and provides a healing message to skin-embedded sensory nerves. Since our skin represents the body's largest organ, possessing vital immune and endocrine functions [83; 84], LED irradiation of skin also initiates both local and systemic responses to disease, through chemical messengers (cytokines, hormones) [85].

The three sets of LEDs (650nm, 420nm, 570nm) are modulated in one of two specific sequences in an on/off pattern. One pattern is the regenerative message, and follows the Red –> Indigo-violet –> Yellow/Green sequence. It represents what esotericists term Life Coming Into Manifestation, a pattern that is responsible for evolution or generation. This pattern also corresponds to the natural progression in the wound healing process discussed above: Inflammation (Red) -> Cell Proliferation (Indigo-Violet) -> Wound Remodeling (Yellow/Green). The other pattern is the rejuvenative message and follows the colour sequence Red –> Yellow/Green–> Indigo-violet. It corresponds to what esotericists call Life Within Manifestation, a pattern that is responsible for enhancing the existing structures, including cells, within the body. This second pattern is rejuvenative in nature, as it promotes enhancement of existing tissue. This makes it suited to, for example, cosmetology. Consequently this pattern is incorporated within one of the more specialised embodiments of coMra-Therapy.

Ultrasound

Ultrasound in coMra-Therapy is used at the frequency of 40 kHz. This has greater penetration than megahertz-based therapeutic frequencies, and does not cause excessive heating [74]. The ultrasound emitters are placed at a 9 mm distance from the skin to provide a very gentle stimulation of enzymatic metabolism. Only in the embodiment for skin rejuvenation are the emitters placed at skin level for additional stimulation.

Geometry and modulation

The geometry, as well as the temporal modulation of the radiances are crucial aspects for achieving overall coherence in coMra-Therapy. Each radiance emitter is therefore positioned specifically according to the role of the particular radiance, and to achieve simultaneous irradiation of the same volume of tissue (Figure 2). Ultrasound emitters and LEDs/magnets are placed radially from the central laser diode.

As a result of experiments conducted with MIL-Therapy it was shown that on/off modulation of the laser diode enables a maximum effect to be achieved in terms of the *effective* penetration or depth. Recent experiments have confirmed this phenomenon [86]. Modulating at 5Hz the laser effect achieves a maximum effective penetration, reaching inner organs and bone. At 1000Hz it penetrates epidermis and dermis only. At 50Hz the effective penetration is moderate, (through subcutaneous layers of tissue and superficial muscles) and with the Variable setting the laser is set to sweep gradually through the range of

Figure 2. Delta Series Laser with four terminals (left to right): Aesthetic, Meridian, Medical and Probe, and a cross-section of the Medical terminal showing 1) near infrared laser, 2) colour LEDs, 3) permanent magnets and 4) ultrasound emitters.

modulation frequencies. LED sequencing is linked to the modulation of the laser diode, but at lower harmonic frequencies.

Application of coMra-Therapy

It is not possible within the space of this article to describe either the principles of application of coMra-Therapy to the body or the clinical experiences of coMra-Therapy. Our aim is to complement our existing collection of studies with an ever-increasing number of reports and clinical trials with coMra-Therapy. I would nonetheless like to outline some pertinent conclusions arising from the combination of radiances that show coMra-Therapy to be such a breakthrough in the evolution of noninvasive medicine.

The emergent synergetic effects of the four radiances make it possible to use them at lower intensities than in monotherapies. For example, a direct comparison of the 980 nm near infrared laser used in coMra-Therapy at 10 mW with a similar monotherapy (LLLT), would reveal the healing potential of the monotherapy, but would not show the healing efficacy of coMra-Therapy.

Another consequence of the combination of radiances is that the recommended doses of coMra-Therapy (times of application) are much lower than in monotherapies. At the same time, there is also no risk of any overdose of coMra-Therapy. LLLT practitioners are well aware of the need for an exact dosage, because of the strong reductions in therapeutic effects in the event of overdosing [87-89]. But for a coMra-Therapy user it is not uncommon to treat a headache after a long day in the office, a newly-appeared back pain, chronic pain in the knees and an allergy during one evening, without any negative effects.
After learning the basics of using coMra-Therapy, any-

one can safely design the best treatment plans him or herself in the case of home user. In the case of a health practitioner he or she can use specific medical knowledge and expertise to fine-tune treatment plans for serious/critical patients. A comprehensive User Guide has been developed with illustrated treatment protocols covering over 200 medical conditions. However the principles of treatment are fairly simple. coMra-Therapy is applied primarily directly over the site of injury and over the organs, blood, lymph, endocrine and nervous systems that are involved in the pathological process. coMra-Therapy also can be used to deliver a healing stimulus to reflexology pressure points and acupuncture points.

CONCLUDING REMARKS

The responsibility for our health at the end of the day rests in our own hands. To give the body love and care is again a choice that every individual can make. Therefore it is the direct responsibility of science and technology to make these choices possible for everyone. It is my greatest hope that after reading this article you will be able to see that medical science and the arts of healing blend into each other casually and naturally, once we approach the body with respect and knowledge.

If you feel that you would like to join us to add your skills and talents to ours, by working with coMra-Therapy and bringing its approaches to benefit your life or the life of your community, please contact us at info@radiant-life-technologies.com. RLT is also open to receiving proposals for basic research and clinical trials.

ACKNOWLEDGMENTS

I am immensely grateful to the late Théun Mares, the founder of Radiant Life Technologies, who shared and inspired me with his vision of the science of coMra-Therapy. And to my dear friends at Radiant Life Technologies: thank-you for your warmth, your unwavering support and for sharing our journey!

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About the Author:

Dr Arzhan Surazakov PhD is the Director of Research and Development at Radiant Life Technologies. After spending years in government-funded research in Russia and the U.S., he could clearly see that the research community, generally speaking, does not fully meet it's responsibilities towards human, plant and animal Life.

In his search for an alternative, Arzhan discovered Radiant Life Technologies, a group of like-minded individuals who had joined their skills and resources to develop technologies that are fully life-supportive. His research into healing effects of non-invasive radiances and observations of the healing efficacy of coMra-Therapy let him to an understanding of the role of science and technology as a process of intelligent cooperation and co-creation with Nature.

College of Syntonic Optometry
2012 H. Riley Spitler Award
Presented to:

Dr. Stanley H. Levine, O.D., FCOVD, FCSO
A Man of Action

To honor his many years of service to the College of Syntonic Phototherapy and for his accomplishments in bringing home therapy to Syntonics.

Dr. Levine passed away on August 1, 2012 at age 83. His presence and expertise will be missed by all.

Born in the Bronx, New York he lived in Perth, Amboy and Metuchen before settling in Monroe Township, New Jersey where he resided until his death. Stan spent the majority of his career as a behavioral optometrist. His care and concern for his patients were his hallmark as was his intelligence and humor. As a member of our Board, he constantly worked to find ways to assist other behavioral optometrists in bringing Light Therapy into their practice. At the time of his death, he was working on a book to assist optometrist in choosing the correct light prescriptions for their patients. He was also an inventor, devising, developing & marketing a Home Therapy Syntonizer. His entrepreneurship was also demonstrated by the partnership he developed with his wife Suzanne and his good friends Richard & Gloria Kowalski in bringing Thomas Sweet Ice Cream & chocolates to his community. His knowledge of vision therapy, including emphasis on Syntonic Phototherapy, was appreciated and acknowledged by all that attended his lectures. Stan graduated from Rutgers University, the Pennsylvania College of Optometry and the Gessell Institute of Child Development. He was an active member of his community as a lifetime Mason and a member of Temple Neve Shalom, Metuchen, Congregation B'nai Tikvah in North Brunswick.

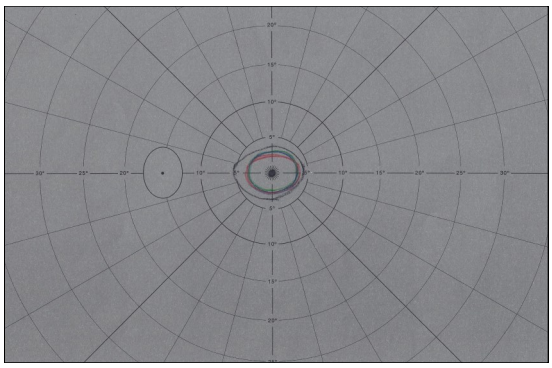
Lighting Up Lives 2013

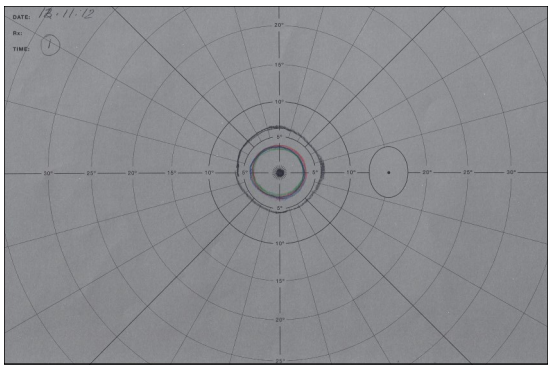
Denise Hadden

The day Sally arrived at my practice I thought that she was a cognitively learning challenged child. She crept in the door immediately behind her mother, hunched back, looking downcast and with an almost hunted look in her eyes. She had been falling over, dizzy, with severe daily headaches, vertigo, and unable to go to school for most of the year.

She could not answer any of my questions, turning towards her mother for assistance and then staring, as though with paralyzed eyes back to look at her fidgeting hands.

She could not read the chart at all, could see no letters at any distance. I managed to get her to look at a near point target, but she was not converging at all and had no awareness of diplopia. Her mother reported that she had been like this since 2009, but her symptoms had become much worse since a trauma experience in 2011. Sally became anxious as soon as reference was made to the trauma and refused to discuss what had happened.





Her white form field was an irregular 5-7 degrees on the right and 3-5 degrees on the left. Her colour fields were 3 degrees on the right and an irregular 2-4 degrees on the left. I was unable to obtain any other results from her. We did one session of light with her in office that day and two days later her mother came to collect a light machine to begin a home syntonic program.

Sally was in fact a high cognitive functioning 16yr old who had been awarded a scholarship to one of the top private schools in the city. Her regular marks for all subjects had been around 85%. She was mildly myopic and astigmatic and her recently made up spectacles had not made any difference to her inability to see. She had become increasingly anxious since 2009 and been on anti-anxiety medication. In 2012 she became more anxious and complained of being unable to see, to the degree that she could not move around comfortably. She was given two different antidepressants as well as the anti-anxiety medication. Sally had not been able to attend school for almost all of 2012.

The first in office light program I used was Violet 10mins, Indigo 10 mins. This is a set program called Pain Relief on the Spectral Receptivity System. Jacob Liberman originally designed this instrument and subsequently the College redesigned the light programs on the instrument. Unfortunately they are no longer available. I gave Sally one of Simon Grbevski's Home Units to complete her program at home.

Sally began a light program on 15th November 2012. She completed 7 weeks of light therapy. On 7th January 2013, I did her last field and she measured at white [form] field 25-35 degrees and colour fields 20-25 degrees in both eyes with normal blind spots.

The program I used was one that I now call my reactive or trauma releasing program as it unlocks people from severe PTSS. Even if your patient requires the red end of the spectrum, a severe level of trauma requires the blue end of the spectrum to bring some distance from the emotional event. Violet and Indigo create distance from traumatic events and allow one to reassess how to respond in the future to similar triggers. Of course, the moment that one's field opens, an entirely new decision making process begins to unfurl.

I checked Sally's fields immediately after the one session of light in office and they showed an improvement to an even 8 degrees on white field and 6 degrees on colour fields. The right and left fields were balanced.

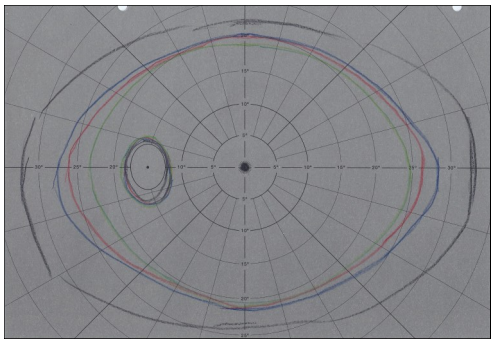
Sally's mother reported that she was grumpy, bad tempered and somewhat oppositional after this session of

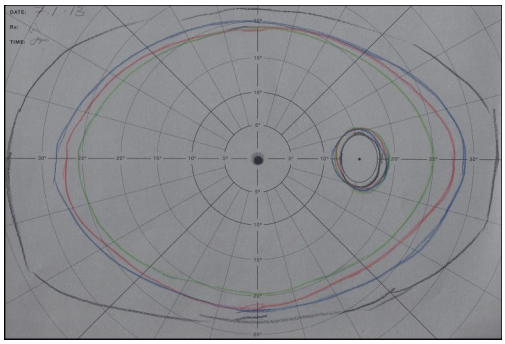
light. She did not want to continue – in fact she had not wanted to do 'this stupid therapy', but agreed to commit to it. Her irritable response was perfect! When we shift our ANS gears to a different brain frequency, we are detoxifying on emotional, physical and mental levels. It is impossible to open a field without an emotional response.

Sally's third field was 2 weeks later and it had increased to 14-16 white field and 9-11 degrees on the colour fields.

She was more amenable, communicative – chatty even! She said that she had been sleeping very well and had been dreaming and remembering her dreams. She noted that she had never remembered her dreams before. She also reported that her psychiatrist had taken her off the two antidepressants and given her one new one.

Her fourth field expanded dramatically to 25 degrees on the white target and 10-18 degrees on the colour fields. Sally said 'I can see now'. Her doctor had taken her off the anti-anxiety meds and now she was on only one milder antidepressant.





Sally animatedly told me about her experiences. She was dreaming wonderful dreams every night, writing them down and when she read over them again, she commented on how much they had helped her to solve her problems.

She actually laughed at how small her field had been and was thrilled to see the dramatic changes in her field. We talked about dreaming and discussed the possibility that God speaks to us through our dreams. She thought this was a 'very cool idea'!

Her final field was another three weeks later and reached the edge of the chart.

Sally began school again this year and has been doing remarkably well. All her symptoms have disappeared. Her vision is good, clear and comfortable. She is no longer dizzy or has vertigo. She sleeps very well and has no headaches. She is a bright, attractive and intelligent young girl with an infectious laugh. And she will tell you that it was looking to the light that helped her find herself again.

Light Program

Violet 10 / Indigo 10 mins
Indigo 10 / Blue 10
Blue 10 / Bluegreen 10
Bluegreen 20 mins
Bluegreen 20
Two days break
Repeat
Two days break
Bluegreen 20 x 5 days
Two days break
Bluegreen 20 x 5 days
Two days break
Lemon 10 / Bluegreen 10 x 5 days
Two days break
Lemon 20 x 5 days
Two days break
Lemon 20 x 5 days

About the Author:

Denise Hadden is a full time private practicing optometrist in Cape Town, South Africa.

In 2001, Denise developed a unique method of field analysis described in her book New Light on Fields.

Denise was invited to present her pioneering work into colour fields and perceptual scores at ICBO, 2010. She further developed and presented her work on subtle fields of awareness at ISSSEEM, 2011.

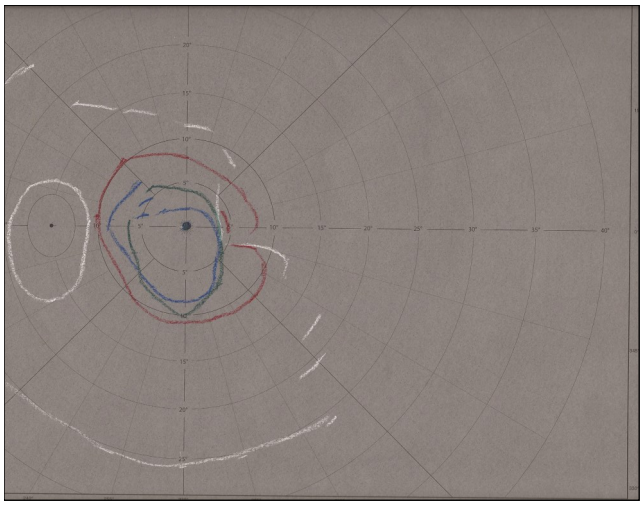
Her new area of interest is in the matching of Light Emission Analysis [Kirlian] with the information obtained from colour visual fields. Contact at www.denisehadden.co.za

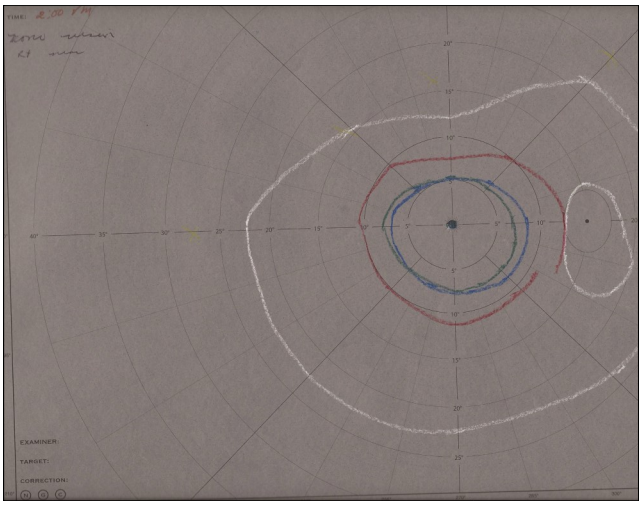
MY LIGHT JOURNEY: A Patient's View

Deborah Summers, M.A.

I agreed, along with my granddaughter, to have our functional visual fields done at the 2012 CSO Conference, as a favor to my sister. Our expectations were that the process would be quick and easy, with the results showing the peripheral vision of a "normal" adult woman and a 12 year girl with cerebral palsy. Then, we would be on our way!

As soon as the results were compared, it was obvious that my visual fields were nothing like the large circular fields of my granddaughter's. Both of my fields showed large elongated blind spots, small colored fields and irregular, collapsed white fields.





One optometrist questioned whether I had ever had a head trauma. Since I had agreed to be a test subject, no medical history was given prior to the visual fields.

Denise Hadden, an Optometrist from South Africa, met with me briefly to say that she would analyze the fields and send me an email with a light plan when she returned home. She warned me that the plan may cause some emotion, including rage and tears. In the meantime, I needed to locate a syntonizer. Quick and easy did not seem to be any part of this.

Ten days later an email arrived with a light plan, as well as encouragement to write in a private journal my feelings and what seemed to come up into my memory. Within days, I felt some relief from the constant neck and hip pain I had been experiencing for many months.

After 10 sessions of light and weekly emails, my sister, a vision therapist, would do a new functional visual field and email them to Denise. With the interpretation of the 2nd field came a new light plan, a long email that included empathy, encouragement, and the following statement: "I can see in your field that you still don't have a lot of desire to keep going in your life." I could not wrap my mind around how someone could say that after being in my presence for such a minimal time. I still had no emotion or tears. I felt empty and I thought seriously of ending this light treatment.

Yet, the emails kept coming from almost 9,000 miles away! We both had made a commitment, so I diligently followed the new plan. Lime was added in the morning then violet and indigo at night. I immediately felt more energy and began to sleep longer. Not only did I write about trauma that I had experienced since retiring 3 years ago, I began to dwell on events that happened over 20 years ago. Prior to this, I had only written about how I felt physically.

My fields were now more symmetrical. Denise addressed my physical state was being stronger than my emotional state. It was suggested that I take a break from using light. Stop using light? At the time I did not understand that I needed to withdraw from the light to allow my emotions to be released.

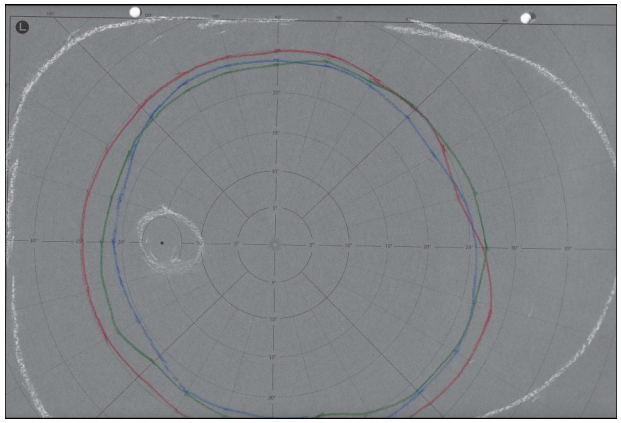
Since the end of May, I had tried to design an elephant stained glass window that I hoped to one day send to Denise in appreciation for all that she had done, but all I could do was stare at the drawing table. During this three week break, my creativity did not return. I began to metaphorically see how that gray beveled glass elephant had been just stuck on that table, just like I had become in my bitterness. I now could admit that my original fields and Denise's interpretation had been correct all along. I needed to work on forgiving myself, as well as others

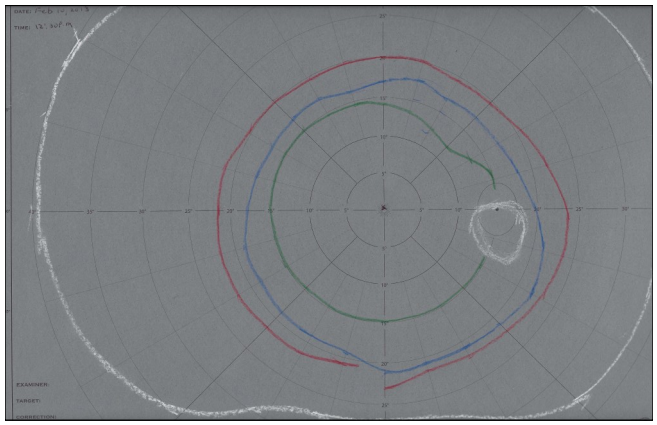
and let go of the events in life that I could not change. During most of those days I cried.

The next round of light was met with a sudden change. On the fifth day I awoke from a dream. As I lay there, I realized that I could not remember the last time I had dreamt. When I did the morning and evening light treatments, I began to notice the beauty and variety in each sunrise and sunset. I now marveled at the deep purple hummingbird that had flown from her nest each morning all through the summer. No longer did I have to wait until one of my dogs alerted me that there was a rattlesnake nearby, as I could spot them before they rattled. I noticed the 47 elephants in my Noah's Ark collection, though prior I had commented that I did not have any in my home. As my visual fields opened, so did my visual awareness.

My family and friends responded to me differently. They commented on how they had seen me change. I had my sense of humor back and we laughed often. I was now willing to do social activities.

Over the summer and fall, physical changes occurred. No longer did I have extremes in blood pressure, high cholesterol, numbness and tingling in my extremities and around my mouth, loss of taste and constant body pain. The neurologist, who had diagnosed me with MS nine months prior and offered no treatment, just shook his head, and encouraged me to continue light.





Where I began as a patient having her visual fields taken has grown to the realization that vision is so much more than just eyesight. I now know that I can use light to manage pain, sleep deeper, as well as to stimulate my energy. I have a new perspective on what really matters in life. Light empowered me to understand my creative potential and purpose in this life's journey.

And, yes, I did finish the Ellie window, along with many other glass creations.

Thank you, Denise, for sharing your expertise and coaching, and for sending me lots of love and light, when I did not have the will or the way or the want to do that for myself.

And thank you, Irene and Ron, for your constant support and trying to introduce me to light in the past.

About the Author:

Deborah Summers is a retired Guidance and School Counselor for Kindergarten through 12th grade students. She has a Masters Degree +60 hours in Educational Psychology and Development. She has received the Pueblo County School District #70 Key Maker Award three times and was the Colorado School Counselor of the Year Nominee twice.

Ms. Summers is also the owner and creator of Hummingbird Hues, LLC. She specializes in custom glass work, portable light units and modern day Babbitt Windows.

International News

BOAF - Review - 2012

1. Year End Review

The year is over and the BOAF is celebrating its first Birthday: Time for a review on the year 2012. A group of motivated Behavioral Optometrists, under the leadership of our president Claus Ellinghausen, our Dean Stefan Collier and our treasurer

Frank Hardy, have created the BOAF as a home of continuing education and further education in the FO/BO under relentless personal dedication. There were very well attended Basic seminars in Bozen/Italy, whose success was coined by the engagement of our dean Stefan Collier and our vice president Danilo Lazzeri. Paola Gerardi and Kurt Dollinger assisted by word and deed.

2. First Annual BOAF Conference

Another fantastic Highlight was the first annual congress of the BOAF from the 29th of September till the 1st of October, also in Bozen. More than 100 colleagues took part in it, amongst them well-known guests such as Bob Williams (OEP) or John Stevenson (BABO). At the same time the CSO was represented by Stefan Collier and NORA through Curtis Baxstrom. The organization left nothing to wish for: from nametags up to Schedules and City-Maps; everything was there, even the handouts from the presentations were available to the participants on USB-sticks in German, English and Italian.

In the beautifully located Hotel Eberle it was very well taken care of our creature comforts and a comfortable Atmosphere. Even the weather planning was very well planned by the „weather god“: rain during the presentations, sun during the breaks. Very special were also the simultaneous translations of all English presentations; Jürgen Eichinger translated passage per passage into German and Danilo Lazzeri simultaneously via Headset for the Italian colleagues. Joe Thiel filmed the whole Presentations and practical Exercised in order to burn them on DVD. These will soon be offered for sale!

On the first day Carline Hurst presented her Contribution on early- childhood reflexes. Demonstrations of practical examples delighted the interested audience. The second day was coined by the Knowledge of Curtis Baxstrom's on the coherence of visual processing in connection to motion and balance and rehabilitation. At the same day the Gala-Evening of the Congress took place. The regional 4 course-menu was accompanied by Ms Weidner singing arias taken from operas and musicals. Stefan Collier was presented with the „live-Fellow“ by Claus Ellinghausen. At the same time did the BOAF hold their very own Award for Stefan Collier which appreciated he Progress of the Fo/Bo in Europe and the whole world. All participating colleagues found this evening to be a very emotional event. Monday offered two parallel workshops, each in german and English with simultaneous italian translations. Stefan Collier showed us the exact execution of vergence- exercises in order to achieve an optimal learning process with integration. Janni Bartels demonstrated the cohesion of seeing and motion.

3. AcuLight Vision

Two weeks later in Berlin another special seminar took place- Sarah Cobb talked in front of 36 Participants about the application of light acupuncture for the diminution of presbyopia and myopia.

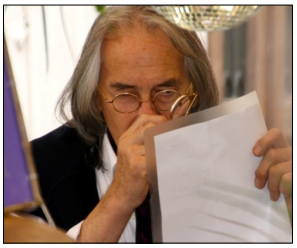
BOAF - Office Info 2013

Planning

For the year 2013 already 9 extremely interesting seminars have been planned. From September 21-23, the second annual congress of the BOAF will take place in Amsterdam. A preconference workshop with Ray Gottlieb and Paul Harris, Robert Hohendorf, Jeff Shayler just to name some of our presenters at the second BOAF annual. We are very much looking forward to it!

Important Dates: (More info on the BOAF website!)

. Practice Assistant education
Austria 08-09 March 2013
. BO - Basic Seminar I
Netherlands 17-18 March 2013
. Abyssal diving into the OEP 21 points
Germany 25-26 May 2013
. Syntonic VT Integration
Germany 15-16 June 2013
. Syntonic Basic 101 class
Italy 29-30 June 2013
. BOAF 2. Annual Meeting
Netherlands 21-23 September 2013



SPAIN – Historically Syntonic Phototherapy was introduced to Spain in 2004 by Pilar Vergara, Optometrist, assisted by Cathy Stern, O.D. FCOVD, FCSO. Since that time many optometrists have embraced Syntonic Phototherapy and become practitioners through the teachings of Stefan Collier and Jesus Espinoza.

In 2008, SIODEC (The International Society of Behavioral Development) was formed. With over 200 members its' influence is spreading throughout the country. Many members utilize Syntonic Phototherapy in the treatment of their patients and we recently welcomed 47 new members to CSO from Spain and nearby countries. Several of the SIODEC members are working toward their fellowships. The Fourth International Congress of the SIODEC will be held in Gijon in 2015.

Welcome to all our new Spanish members!

Practice Management: Syntonics Home Therapy Program

Simon Grbevski, B Optom, FCOVD, FCSO

To keep the interest going during the syntonic sessions there are three things you can do the following: Play some of the games below, secondly listen to some music or stories or just have some quiet time watching the colours.

How to let your body experience the full benefits of your syntonics session:

- Go to a quiet totally dark room, free yourself of interruptions for approximately 25 minutes.
- Get into a comfortable position. Laying back at about 45 degrees and slightly raised feet.

- Don't try so hard**.** Be gentle on yourself. Your goal is to slow down and quiet your mind. Don't try so hard.
- All you have to do is allow your eyes to look into the coloured light. There is no right or wrong way**.** There is really no such thing as right or wrong.
- Before starting session have a glass of water.

Game 1:

Alphabet Game During Syntonics

The goal here is not to just learn the alphabet but rather learn how to visualize and learn visual sequencing.

During the exercise the child is required to make a mental picture ("see the letters in your minds eye") of each of the letters as they are being verbalized.

LEVEL:

1] Recite alphabet song. – Have child sing the alphabet song.

2] Have child say alphabet one letter at a time in monotone a – b – c – d – e …. etc.

3] Say alphabet to a beat – 60 bpm (one beat per second of time), 30 bpm (on every second beat).

4] Say the next letter after me in sequential order slowly eg: - assistant "a" > child "b", assistant "c" > child "d", assistant "e" > child "f", etc.

5] Say the next letter after - in random order eg: assistant "a" > child "b", assistant "k" > child "l", assistant "e" > child "f", etc.

6] Say next two letters after me – assistant "ab" > child "cd", assistant "ef" >child "gh", etc. Do whole alphabet in sequential order slowly.

7] Say the first letter before this one – assistant "d" > child "c", assistant "g"> child "f", etc. Do slowly.

8] Say the two letters before these - assistant "gh" > child "ef", assistant "pq" > child "no", etc

9] Say the whole alphabet backwards – in reverse order starting from "Z", from "H", from "P" etc.

10] As a refresher try this exercises – "say the next three letters after these –", OR "say the three letters before these –"

Notes for assistant:

1] Must get two sequences of the each stage correct before progressing to next level.

2] Remind patient – "don't forget to see the letters in your minds eye!"

3] Highlight when made error at first by asking - "did that sound or look right?"

4] say letters slowly and ask them to respond slowly- this will encourage Patient to improve attention and concentration skills.

5] Encourage self awareness of errors made - ask - where was error - what was the error?

6] Encourage awareness of visual sequence.

7] Ask if seeing/ visualizing the letters in colour or black and white. Encourage to see them in colour.

Game 2:

Clap to the Beat Game

Aim: To teach awareness of timing and visualising auditory sequencing.

Method:
Level 1]
a) Assistant claps a fix beat. Child has to see if they can clap in time with assistant.
b) Repeat varying the beat. It is very important the child claps exactly in time.
c) Here tell the child when you say "stop" they must stop clapping then when you say "go" they start again trying to get backing in time.

Level 2]
Assistant claps out one of the sequences from the below samples. Child is asked to try to picture the beat either as dashes or dots in their minds eye. Then clap the sequence back.

Level 3]
Sound out the vowels "a e i o u" to a beat. eg 60 bpm …

Say the vowels every 2nd , 3rd , or 4th beat.

Say each vowel for 2 beats, for 3 beats, 4 beats. By '- ae . . ee..-ie. Oo- uu.

Game 3:

How Do I ….?

AIM: Explain how to do a certain daily task
Break it down to more specific stages each time repeats the explanation.

Eg A: Explain to me what you do in the morning to put your shoes on!
(Child) : "I get my shoes and put them on"
(2stages given (i) get my shoes (ii) put them on.
(Assist) : Where were the shoes – now tell me again"
(Child) : "I go to the wardrobe get my shoes & put them on
(3 stages given (i) go to wardrobe. (ii) get shoes (iii) put on
Cont increasing specifics of what has to be done to put shoes on……

Final : I walk to my wardrobe, open the door, I pick up my shoes, I close the cupboard doors, I go to my drawer pull out my socks, I sit down on my bed, I slip on my right sock and then my left. I put my right shoe on, do the laces up then I put my left shoe on, do the laces up. (13 stages)

Level 1: 6 stages minimum
examples for this level - brush teeth, tie laces up, do shirt up.

Level 2: 10 stages minimum
examples for this level - put shoes on, pour glass water, ride bike.

Level 3: 12 Stages minimum
examples for this level - set table for dinner, get to a place (school, grandmas, shop) play a sport (cricket, T ball, soccer)

Syntonics Home Therapy Program

Name: _____

Date: _____

Procedure: Find a totally dark room, have patient sit comfortably even if laying back slightly. Position the syntonise unit about 30 to 40 cm from their face and at eye level.

Method; Put on the Red Blue goggles on with the Red Lens infant of the non dominant eye. Turn the syntonises unit on with no filters only the white light shinning.
Do this for 3 minutes.

Syntonic Prescription:

Week 1: _____

Week 2: _____

Week 3: _____

Week 4: _____

About the Author:

Simon Grbevski graduated in Optometry from the University of NSW in 1976. Two years later he established his own private practice in Rockdale, marking his 34th year celebration.

He has dedicated his life to helping individuals achieve the best possible vision through vision therapy and lenses. Internationally renowned for his strengths in Behavioural Optometry; he be came the founder of the Australian College of Behavioural Optometry as well as the Australian College of Syntonics of which he is currently President.

Simon Grbevski has lectured locally and internationally and has promoted Behavioural Optometry on Austral ian television.

He is involved in the design and production of Optometric Equipment as well as Sports Vision Equipment. Sports Vision was designed to help train athletes for peak performance and achieve the necessary edge to win gold. His equipment was use d at the Atlanta Olympics to test the action and reaction times of the world's most elite athletes.

He also worked with the Penrith Panthers Rugby League team and Sydney Kings Basket Ball teams

Historical Perspective

(Ed. Note reprinted from the CSO Journal in January 1980, Harry Riley Spitler's thoughts and word are still very germane to today's optometric practice. Reprinted once again to make sure that we all share brilliance from the past).

The Syntonic Principle

By Dr. Riley Spitler (from the "1936 Year Book of Optometry")

And there is a principle.

That principle is old, very old. And if the writer's memory serves him right, it is recorded as having been effectively used in one of the early chapters of Genesis. Whether this be legend or fact, the fact remains that it is there recorded. A more recent to the same principle appears in "Compost for Shepherds," written in 1493. Yes, that date is correct.

Not because of its antiquity is this principle right, but because of the verities which are eternal.

As long ago as 1909 the writer was taught the use of light for therapeutic purposes, both "straight" and filtered. He so used it for a number of years, but it was not until June of 1919 that the thought of applying treated light to the human eye, other than by the use of geometrical optical means, occurred to him. Historically it might be cited that to Dr. Francis P. Barr, then an instructor in Applied Optics at Ohio State University, should go the credit for instilling the thought that has evolved into what has now become known as "Syntonic". During the same course, Dr. Charles Sheard, then at Ohio State University made a suggestion relative to skiascopy which, taken with the statements previously made by Barr, resulted in an eleven year search for a means of applying in a practical manner the involved principle to ocular problems, within physiologic limits, as they present themselves to optometrists.

During the summers of 1920, 1921 and 1922, experiments were conducted with the help of Dr. F. F. Wilcox, but no conclusive results were obtained. "Things" happened, but they apparently had no connection with the known facts of physiology. In 1924 the writer had the good fortune to contact Dr. Arthur Hoare, who at a subsequent date directed him to a recent work by Raup. It was here that the key to the dilemma was discovered. Acting upon the theories advanced by Raup, the entire matter of apparently contradictory results, began to have a meaning, to make "sense", as it were. Blueler had already, in 1922, neologized the principle, elucidated by Raup, and had, in fact, set forth certain criteria which proved invaluable in developing to a practical status the experimental data which the writer had previously accumulated, i.e., prior to contact with their works. Contact with the writings of Faulkner, and those of Babbitt lent a directory influence to the investigations. Of course, it is to be expected that "me too-ers" will attempt to mislead, but optometrists may be here assured of the facts, documentary proof of which is in the files of the College of Syntonic Optometry.

Now what IS this principle?

To be common-place, it is just what the name implies. Syn, from Greek, and tonos, from the same language, when used together in the one word, as used by Bleuler, connotes merely a balanced, integrated nervous system. It certainly does NOT mean the use of filtered light, nor does it mean "tuning" to a light frequency, as some would have you believe. Balance of the nervous system as it applied to ocular function, its associated or supportive functions, is ALL that is sought for or intended by this technique in optometry. Integration of the nervous system, within physiologic limits, is not as simple as the foregoing might imply, yet, the application of this principle will solve all of the optometric departures from the normal that fall to the lot of the optometrists to handle.

The "functional powers" of a pair of human eyes are dependent upon and mediated through the nervous system. This involves the brain, the cord and autonomic nervous system. Optometrists have some physiological optics, yea, anatomy, physiology and pathology, as it pertains to Optometry, the latter for the sole purpose that they might recognize and undertake only those cases in which the departure from the normal was within the limits of physiologically normal processes. Yet, with all this teaching, they have not been taught a number of purely optical means of integrating the several nervous functions involved, to the end that the patient may have effective, comfortable, single, binocular vision. It is this latter phase of the subject that the writer has entered upon and to a large extent succeeded in so ordering that hundreds of optometrists are now able and capable of doing those things. AND THEY ARE DOING THEM.

In order that this principle might properly be applied, it has been necessary to develop and to teach no less than EIGHT new basic criteria for the determination of certain physiological limits here-to-fore never taught to optometrists. Not only that, but no less than Eleven optometric diagnostic methods have been evolved so that optometrists may know just what must be done in any given case to re-establish such integration of nervous function as is necessary for proper physiological ocular function to prevail. Furthermore, that optometrists may not go astray in the clinical application, it is necessary to develop THREE forms of preparation of the patient prior to the application of the syntonic principle. It has then been required to set forth no less than ONE HUNDRED FIFTY-FIVE separate and distinct ocular or associated functional departures from the normal that may occur within the limits of normal physiological processes, and to state the means of producing a proper nervous system integration in each of them. NOWHERFE ELSE in the literature - optometric or otherwise - can be found these correlations and methodical applications, "me too-ers" to the contrary notwithstanding.

Here it must be said that the known facts of physiology involved are not new, but their application to optometric problems is new. Here the writer is reminded of a remark made at the close of a class session, by a man high in educational circles, a man whom you all know, "Riley, it's confounded shame

that you have to hop about the country to teach these fellows the physiology they should have been taught in school, both as to the facts, and application." This man certainly did not intend censure of the schools as such, yet he recognized that certain basic truths taught in the course in syntonics should be common knowledge to all of the biological profession, of which Optometry is one. To cite one concrete example, the fact that skeletal muscle has single activating innervations and visceral muscle has dual innervations. Yet those two kinds of muscle and an understanding of their physiology are vital to the practice of Optometry.

It appears from the foregoing that syntonics is merely the elicitation of nervous reflexes for the emendation of vision and the visual functions, nothing more. That's right. The mediating mechanism of all ocular function being nervous, the very act of seeing, as such, being so mediated, it therefore, appears that any optical correcting means should be and is the proper and indicated optometric approach thereto. In syntonics this approach is made through the use of lenses, prisms, absorptive media and so-called "orthopic training". The method of training is premised solely upon re-establishing integration of visual and associated ocular function, either as a result of the utilization of the normally present reflex mechanisms, or as changes might take place in the transmitting ocular media, never as a result of establishing conditioned responses. "Orthopics" so premised is new to Optometry. This development is just another phase of the application of the syntonic principle.

Syntonics is not an instrument. Its principle may to a large extent be applied by many existing optical accessories in everyday use. However, to get maximum results from the professional use of the principle it is best to make use of physiologically calibrated media. These are available.

Another syntonic principle in applied Optometry is the taking into consideration the fact that developmentally the nervous system of individuals differ quite widely. This fact has long been recognized by animal breeders. Dogs vary to almost unbelievable extent as found by Pavlov, later experimentally determined by Stockard. Human beings vary even more so. In other words, to the same stimulus the reaction may vary in kind and degree as between differing nervous constitutions. This, in some measure, accounts for the varying responses we find in patients under identically the same diagnostic optometric tests. Yet, we have for decades been placing them in our refracting chairs and attempting to make these varying reactions fit into some particular sort of a syndrome which would enable us to prescribe. We have not taken into consideration the possibilities inherent in nervous constitutions. In syntonics we do, and we know why we do.

The writer felt highly complimented when, after completing the presentation of the Basic Course in Syntonics, a widely known optometrist said to him, "Riley, you've brought to Optometry its first new principle in almost a hundred years."

I believe he is right.

Dean's Report: Phototherapy Research Update 2013

Ray Gottlieb, O.D., Ph.D., Dean CSO

Light medicine continues to increase the list of conditions it can aid and to expand our understanding of the scientific basis of why, how and when phototherapy works. At the 2013 meeting of the North American Association of Light Therapy (NAALT) conference in Florida, the list of presentations summarizes this trend. The list included: pain control of knee osteoarthritis, retinal degeneration, age-related macular degeneration, laser acupuncture for children with uncontrollable bronchial asthma, osteoarthritis, muscle performance, post-concussion syndrome, intranasal light for brain stimulation, COMRA-therapy increases bone mass density in osteoporosis, anti-inflammatory effect of 635nm, oral cancer, tissue repair of achilles tendon, muscle strain and bone repair in rats, 670 nm for spinal cord injury, and fibromyalgia syndrome and myofascial pain. NAALT is one of several phototherapy organizations that syntonic practitioners should consider joining. Others include: American Society for Photobiology and WALT (World Association of Laser Therapy). The following two articles are for those smart enough to include exercise among their lifestyle choices.

Effects of low-level infrared treatments following physical strength training

A typical example is this study that found that LLLT optimizes human muscle performance in physical exercise. Treatment with low power infrared (808 nm) light plus strength training increased muscle performance compared with strength training only. The light was applied over the quadriceps immediately following their leg-press training. Each leg received 140 seconds of light for 12 or more consecutive weeks. The training-only group exercised without the light. A control group received neither exercise nor light. Compared with the untreated exercise group, the light treatment group gained double the leg-press and isometric strength, twenty-six percent (26% to 55%) over the unexercised, untreated controls who measured no significant change.

Cleber Ferraresi, et al, (2011) Effects of low level laser therapy (808 nm) on physical strength training in humans. *Lasers Med Sci* 26:349 –358

Low-level laser therapy before exercising improves performance, skeletal muscle status, and oxidative stress.

A 12-minute low-level laser treatment given five minutes prior to treadmill running resulted in better performance and decreased exercise-induced oxidative stress and muscle damage compared with subjects who exercised without the light treatments. The study was double-blind and placebo-controlled. Twenty-two men received a 30-second light treatment on each of 12 sites on both legs (six in quadriceps, four in hamstrings, and two in gastrocnemius) before running on a motor-drive treadmill until exhaustion. The light source was infrared, 810 nm, and low power, 200 mW).

Thiago De Marchi, et al, 2012) Low-level laser therapy (LLLT) in human progressive-intensity running: effects on exercise performance, skeletal muscle status, and oxidative stress. *Lasers Med Sci* (2012) 27:231–236

Intense Pulsed Light Therapy improves Dry Eye

Intense Pulsed Light Therapy (IPL), FDA approved for dermatologists to treat vascular facial lesions, rosacea spots, and pigmentation, is being used in an off-lable application for dry eye and blepharitis (lid inflammation). Specifically designed for dry eye by Memphis ophthalmologist, Rolando Toyos, the IPL is a flashgun device that delivers high intensity short bursts of light at specific wavelengths between 500 and 800 nm.

First the lower face is treated from ear to ear. Then, with their eyes closed and upper lids covered by an eye shield, the patients receive the light pulses on their lower eyelids. The light energy is absorbed into the blood and this heats the lid tissue. The warmth liquefies the plugged meibomian glands at the lid margins. The glands are then massaged, forcing them to secrete their oily fluid that spreads over the cornea and aqueous tear layer thereby delaying its evaporation. The light treatment can also eliminate the offending bacteria, parasites and inflammatory cytokines that contribute to meibomian gland dysfunction and blepharitis. The heat transfers to the meibomian glands in the upper lid that begin secreting oil as well.

A course of treatment usually requires three to four IPL sessions given over the course of four months. The re-

sult? According to Toyos the meibomian gland disorder improves: the lids look clearer with less erythema, fewer blood vessels, thinner secretions, and most important, reduced symptoms. Once the condition has normalized, the patient returns for maintenance treatments every six months to a year. Younger patients generally require fewer treatments. Toyos claims that thousands of patients have been treated successfully and hopes to conduct a large multicenter trial in the near future.

Christopher Kent, Senior Editor, (2010) Intense Pulsed Light for treating dry eye
Review of Ophthalmology, Published on line: 11/16/2010

Melanopsin, Photosensitive Retinal Ganglion Cells (RGC) Roundup

Diverse Types of Photosensitive RGCs Identified

Until recently, the "fact" was that all neural light reception in the retina occurred via rods and cones. Now the facts have changed. Studies on how light adjusts the phase of the circadian rhythms to the day length, led to the breakthrough discovery in 2002 of a third, non-rod, non-cone photopigment called melanopsin in a unique type of ganglion cell in the inner layers of the mammalian retina.

The phylogenetic origin of melanopsin as an invertebrate photopigment predates the development of the eye as the organ for vision. The photosensitive RGCs contain a uniquely large population of mitochondria and cytochrome c oxidase involved in the production of ATP and other functions vital to cell and tissue health. They also express a pituitary hormone, PACAP (pituitary adenylate cyclase-activating polypeptide), known to have neuroprotective properties. Photosensitive RGCs make up about 0.2% of the total number of RGCs, approximately 3000 out of a total of 1.5 million in the human retina. Their cell bodies are much larger, their dendritic tree diameters the largest of any known primate RGCs and their extensive retinal meshwork of highly overlapping processes cover the retina. Cell counts range from 3–5 cells/mm^2 in the periphery to 20–25 cells/mm^2 in the parafovea where they spiral around the foveal pit. The typical parafoveal non-photosensitive RGC density is about 50,000 cells/mm^2.

Initially it was assumed that there was only one type of the photosensitive RGC, but at least five RGC photoreceptor subtypes have been identified in the mammalian retina, each with distinct differences light sensitivity, structure, molecular identifiers, functional actions, input/output properties, and brain projections. Research articles appear monthly with news about diverse types of photosensitive RGCs, how they connect and interact with rods, cones and other retinal cells, the brain centers they connect to, the local and systemic functions they influence, and their role in health and disease.

These new findings prove many of the mechanisms suggested by H. R. Spitler in Chapter 6 of *The Syntonic Principle*. (Many reference the same research from the 1910's, 20's and 30's as Spitler did.) The future looks bright as this new research brings us closer to knowing more about the specifics of how syntonic phototherapy might work and opens possibilities of a broader range of conditions and more specific treatment and diagnostic protocols to optimize syntonic treatment.

Photosensitive RGCs transmit environmental information directly to "non-visual" brain centers such as:

- the superchiasmic nucleus for photoentrainment of circadian rhythms,
- the ventro-lateral preoptic nucleus that contains sleep active neurons,
- the subparaventricular zone for temperature and hormone regulation;
- the olivary pretectal nuclei for afferent pupillary light response,
- the lateral habenula, linking limbic and striatal areas,
- the amygdala for regulation of emotions,
- the intergeniculate leaflet of the thalamus for mediation of non-photic regulation of circadian rhythms, and
- the locus coeruleus and other alertness-related subcortical structures.

Andrea Sand, et al; (2012) Diverse types of ganglion cell photoreceptors in the mammalian retina. *Progress in Retinal and Eye Research:* 31; 287-302

Photosensitive RGCs also Merge Light and Color Input from Rods and Cones

Although the rods and cones have been considered the only photoreceptors involved in conscious visual imagery. Brain projections from at least one type of photosensitive RGC have been traced to the lateral geniculate nucleus. This suggests the possibility that they may contribute to conscious visual perception. One study using microelectrodes to monitor electrical activity in individual cells

found that this photosensitive RGC subtype responded when high contrast targets were presented on a grey background.

Some types of photosensitive RGCs merge their intrinsic melanopsin input with signals from rods and cones. There are at least three types of cones in color sensitive primates: blue (short) wavelength sensitive S-cones; green (middle) wavelength sensitive M-cones; and red (long) wavelength sensitive L-cones. Color vision is thought work by judging differences (color opponency) between the responses from the three types of cones rather than the individual response from each type of cone. Opponency is a complex of interactions served by the retinal photoreceptors, bipolar, RGC, other neuroretinal components, and brain centers including the lateral geniculate and visual cortex. There are three known opponent processes: red versus green (L-cone versus M-cone), blue versus yellow (S-cone versus a M-cone - L-cone combination, and black versus white (contrast and light level). Opponancy brings a more refined interaction and range of color sensitivity that serves not only for color vision perception but also to inform the melanopsin RGCs about subtle variations of environmental color and light level. Some researchers have suggested that the cone color-opponency circuitry may have evolved originally to signal the large spectral changes at dawn, dusk and through the day to more precisely set the biological clock to the solar day. (Not that our modern lifestyle finds most of us outdoors, especially at dawn.)

Dennis M. Dacey (2005) Melanopsin-expressing ganglion cells in primate retina signal colour and irradiance and project to the LGN. *Nature*: 433, 749-754

Hattar, S, et al. (2003) Melanopsin and rod–cone photoreceptive systems account for all major accessory visual functions in mice. *Nature*: 424, 76-81

Photosensitive RCG Implicated in Human Disease

Blind patients with no light perception, such as following enucleation of both eyes, lose circadian photoentrainment. On the other hand, blind patients such as those with Leber hereditary optic neuropathy and dominant optic atrophy have extensive loss of RGCs but because their photosensitive RGCs remain viable they retain normal circadian photoperiods and pupil reflexes. In advanced glaucoma, some studies have found that all types of RGCs degenerate, including the photosensitive ones, leaving patients with suppressed circadian rhythms and compromised pupil reflexes. On the other hand, patients with chronic ocular hypertension are reported to retain these functions.

Bright light therapy is being used for an increasing list of circadian disorders, likely related to photosensitive RGC dysfunction. These include: major, bipolar, and ante- and post-partum depression, premenstrual syndrome, obesity, eating disorders, attention-deficit/hyperactivity disorder, Parkinson disease, and Alzheimer patients with severely impaired rest–activity rhythms. Research suggests that seasonal affective disorder may be caused by compromised melanopsin gene, that migraine photophobia and sick headache involves photosensitive RGC input, and that the sleep and other circadian disturbances so common in the elderly may be due to a loss of photosensitive RGCs found in aging retinas. This loss of photosensitive RGCs also suggests a connection to the retinal pathology and circadian dysfunction in Alzheimer and Parkinson disease.

Chiara La Morgia (2011) Melanopsin-expressing RGCs: implications for human diseases. *Vision Research:* 51; 296–302

Aberrant Light Causes Melanopsin RGC to Brings Down Mood and Cognition

Aberrant light can directly and significantly impair mood, cognition and synaptic plasticity of mice without altering their circadian rhythmicity or sleep. In this study, aberrant refers to light/dark periods not in synch with the normal circadian day/night cycle. All the mice were raised together in a 12h/12h light/dark environment for six months. Half were then moved to a new cage with a 3.5h/3.5h light/dark cycle repeated around the clock. The control mice remained in a 12h/12h light/dark cycle. To avoid shifting their circadian and sleep patterns, both groups received 800 lx during their lighted phases. That is somewhat darker than an overcast day rated at 1000 lx.

After two weeks, mood and learning behaviors as well as circadian phase shifts were evaluated and compared. Compared with control mice, aberrant light mice appeared depressed - indicated by immobility, anhedonia, and decreased sugar preference; had hippocampal learning deficits - poor spatial learning; a recognition memory impairment – no preference for novel vs. familiar objects; and were more easily frustrated by a difficult learning challenge. The aberrant light group also had elevated corticosterone levels (associated with depres-sion in humans) even though their corticosterone rhythms remained normal. Sleep and circadian measures (body temperature and activity behavior) were normal for both groups of mice. An interesting note was that when the aberrant light mice were medicated with antidepressants (fluoxetine or desipramine), known to reduce chorticosterone levels, the mood and learning dysfunctions were eliminated.

If these findings also hold for humans, they may indicate how aberrant light caused by shift work or by simply switching on an artificial light might impact mood and learning. The low level of light, 800 lx, suggests that even small alteration of light timing or color can alter brain and body functions. They may also be a clue here for how syntonics works and ways we might improve its application.

Tara A. LeGates, et al, (2012) Aberrant light directly impairs mood and learning through melanopsin-expressing neurons. *Nature*: 491: 594

Light Exposure During Pregnancy Key to Normal Eye Development

More melanopsin news. An article in *Nature* reports that retinopathy of prematurity (ROP) and other developmental diseases of the eye may be due to the failure of a melanopsin "light-response pathway". In ROP, over-development of retinal vessels causes intraocular pressure to spike that results in severe retinal damage and blindness in pre-term infants. The findings support a model that light passes through the mother's body, enters the fetal brain and eyes, and stimulates the melanopsin light response pathway. This triggers events that lead to the normal development of the retinal vascular system and absorption of the hayloid vascular system, a fetal vasculature necessary for lens development that subsequently regresses to allow for a clear vitreous in normal ocular development. Melanopsin is posited as the light receptive element which, when properly illuminated in the fetus, modulates vascular endothelial growth factor (VEGFa) to prevent pathological vascular growth in the hyaloid and retina. The findings support the hypothesis that elevated VEGFa in the retina is due to an increased need for oxygen as more and more of retinal neurons develop. Failure of the light to reach the brain and eye prevents the expression of anti-VEGFa, without which the retinal and vitreous vasculature over-develops, and eye disease and blindness result. This was investigated initially when the offspring of mice kept in darkness while pregnant suffered a pathological increase of hyaloid blood vessels and abnormal growth of the retinal vascular system. Melanopsin is found very early in both mouse and human gestation and is known to function long before the rod and cone opsins. Although these discoveries were originally investigated in mice, according to the researchers, it is very likely that the anti-VEGFA melanopsin light response pathway scenario is active in human ocular development.

Sujata Rao et al, (2013) A direct and melanopsin-dependent fetal light response regulates mouse eye development. *Nature*: Published on line before print Jan. 16, 2013

Bright light stimulates brain through the ear canal, widens visual awareness

Finnish researchers used light to stimulate the brain via the ear canals to discover photo-driven effects on functional brain organization. They chose the ear canals because they allow a more direct path to the brain by minimizing light absorption by skin, blood and bone found in typical transcranial photostimulation. Other studies found that bright light ear canal therapy reduced SAD symptoms. They wanted to discover whether brain matter was directly sensitive to light without visual input. Twenty-four young, healthy adults received light stimulus and 26 received sham treatments while in the resting state with functional magnetic resonance imaging (BOLD fMRI) brain scans to investigate functional connectivity changes of the brain. Light from two 3 W LEDs, main peak at 465 nm (blue) and secondary peak at 550 nm (green), was delivered to the subjects' ears via light fiber to ear-plugs while subjects they lay inside the scanner with their eyes properly covered. The light flux intensity (7-8 lumens) was similar to bright sunlight in the ear canal when turned towards the sun.

Two consecutive resting state scans, each lasting 8 min 24 s. were performed with the instruction for the subject to lay still. The first scan, without light, provided control data. The second scan for the light group was light alternating on and off every 30 seconds and no light for controls.

Light stimulation to the brain seems to induce a gradual increase in functional connectivity of the lateral visual network during the course of the stimulus. Lateral visual networks and discrete cerebellar brain regions showed a gradual increase in functional connectivity in the light stimulus group compared to sham controls. The light responses in the visual cortex and cerebellar areas shared a temporal similarity. After some delay, a steep increase in functional connectivity occurred some minutes after the start of the light phase of the experiment and appeared to plateau at around six minutes. Lateral visual, largely the extrastriate, cortex, is directly related to the ventral stream serving visual perception - object, "what is it" - and the dorsal stream serving visual action - spatial, "where is it". The lateral visual networks are substantially involved in complex visual attention, visual awareness and visual consciousness. This activity in the visual areas of the brain led the authors of this article to comment that some experimental subjects described a *clearer and widened field of view* they experienced some time after the end of their light stimulation. These descriptions by a few of the light stimulus subjects and others, who had tried

the light stimulus but were not in the present study, were spontaneously reported and very similar to each other. None of the sham group and the majority of the light subjects did not mention post-treatment changes.
These comments were very encouraging for me to read because it is the first time I have read anything outside of syntonics about anything resembling a visual field increase related to light stimulation (blue/green in this case). The article's authors did express curiosity about factors that may cause some individuals and not others to be susceptible to the light and suggested conscious observation threshold differences as a possible explanation. My guess is that the individuals reporting this subjective increase in vision may have had depressed functional visual fields prior to the light stimulation, perhaps with a mild head injury in their past. Too bad visual fields and syntonic case histories were not part of the study. I'm wondering what a combination of syntonics and bright light ear canal stimulation would bring.

This article covered much more that what I have reported here about the various photosensitive opsins that have been found in the brain and other places through out the body, other brain areas that the scans showed also increased connectivity from the light, and a theoretical discussion to explain how brain areas that did not themselves receive direct light had significant increases in functional connectivity.

Tuomo Starck (2012) Stimulating brain tissue with bright light alters functional connectivity in brain at the resting state *World Journal of Neuroscience*: 2, 81-90. This article is in a "free access journal" and is available on line at http://www.scirp.org/journal/PaperInformation.aspx?PaperID=19417 (click where it says PDF in red).

I'll mention two other studies about bright light stimulation through ear canal. The first one: Therapy Via Ear Canals Improved Reaction Times of Top Athletes in a Placebo-Controlled Psycho-Motoric Study, claims that top Finnish professional ice hockey players who used the Valkee bright light headset (ear canal stimulator) improved their motor reaction times by 20% compared to 12 untreated teammates who improved by only 4%. These athletes used the light for 12 minutes each morning for three weeks. All were in top shape with already extremely fast reaction times before the light therapy. This was reported in November 2011 as a press release with no reference to article publication. You can find information about this and the next study and more about the Bright Light Headset at: www2.valkee.com.uk

In the other study: The Effect of bright light treatment via ear canals on attention as measure of neurophysiology – A Randomized Controlled Study, forty-one university students were randomized into light-treated and control groups. The light therapy subjects received 12 min daily doses after awakening at home for three weeks. Tests of attention, masked character recognition and depression were administered to both groups before and after the three-week trial. Character recognition time for the light group was improved by 20 ms and 3 ms for controls. Depression measures fell from 4.39 to 2.69 in the light group and only from 4.76 to 4.52 for controls. (Perhaps they were more depressed because they weren't picked for the light group.) This was presented as a poster at the Scandinavian Physiological Society's 2012 Annual Meeting: Jurvelin et al.

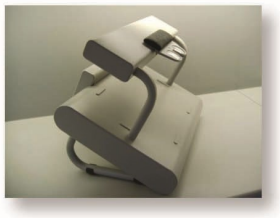
About the Author:

Ray Gottlieb, O.D., Ph.D., is the Dean of the College of Syntonic Optometry.

Now retired from optometric practice, he lives in Florida where he conducts classes and consults about natural vision improvement. He is an OEP Clinical Regional Seminar Presenter. In summer he serves on the piano faculty of the Chautauqua Institution (NY) where he applies vision training to improve playing and learning skills of piano students.

His writing includes *Attention and Memory Training: Stress-Point learning on the Trampoline* (OEPF 2005), *The Neurophsychology of Nearsightedness* (PhD dissertation 1977) and many articles and chapters. His presbyopia reduction exercise is available on DVD as *The Read Without Glasses Method.* He is a recipient of CSO's Spitler Award and NORA's Advancement of Science Award.

 # 1 COFMA (Colorfield Machine)



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About the Cover

Boris Surazakov, an artist, and his son Dr Arzhan Surazakov PhD use colour in their work to communicate a message. The cover art shows a fragment of a painting by Boris Surazakov ("Kara-Tash", 1997, oil on canvas, 79X130 cm, www.altaiart.com).

The colours create a sense of beauty and emotional interplay as envisioned by the artist. In Coherent Multi-Radiance Therapy colours deliver a regenerative or rejuvenative message to the diseased cells to support the healing process.

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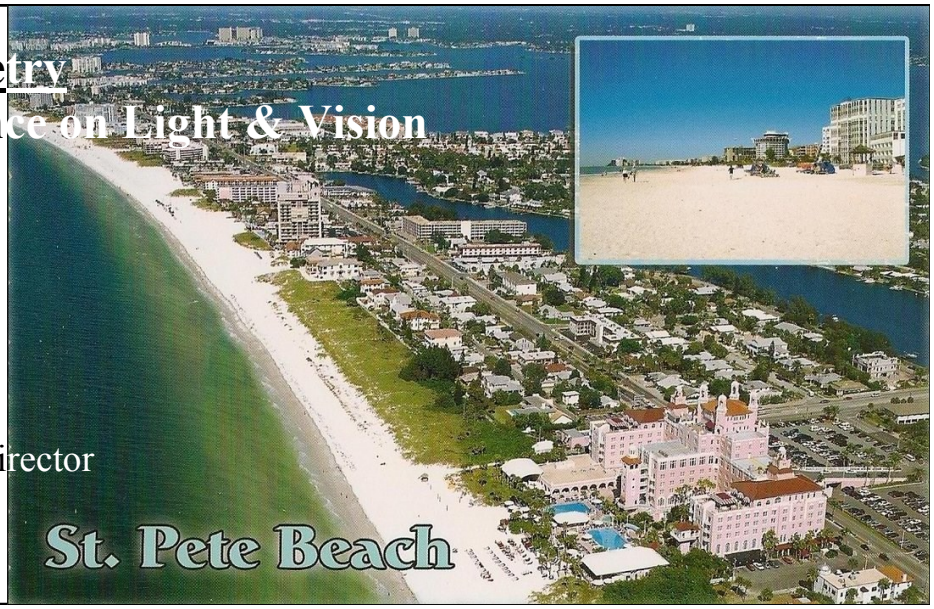

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