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College of Syntonic Optometry

VISUAL ADAPTATIONS IN RELATION TO THE BIOPHOTOMETER

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Vitamin "A" is the outstanding Vitamin as far as the eye in itself is concerned. Vitamin "A" is important since it is the precursor of visual purple, the photometric substance found in the rods of the retina. The amount of visual purple present determines the ability of the eye to adept itself to sudden changes in light intensity. For measuring the regeneration of the visual purple after exposure to a bright bleaching light, the Biophotometer is employed. With this instrument precise measurements of light can be made in terms of millifoot candle power. Through the Biophotometer it is possible to ascertain, in as short a period of time as two weeks, whether or not a case of dysadaptation will respond to Vitamin "A".

To appreciate the value of the Biophotometer after the degree of dysadaptation is known, the type of dysadaptation must be determined in order to arrive at a true diagnosis. In this the ophthalmoscopic examination and visual charting of the fields are essential in determining whether the interference is organic or functional. The organic type involves a definite disease or serious disturbance of the rod structure, or visual purple metabolism. For this condition there is a present no known definite cure. The functional or intent type of pathological dark adaptation is due to Vitamin "A" deficiency. This type will respond to treatment whether the treatment be simply Vitamin "A", or applied Syntonics, or both. In this respect the Biophotometer is valuable in ascertaining the importance of food values. With the assurance of increasing or already high Biophotometer curves, a relatively greater response to Syntonics can be expected to follow.

In treating ocular disturbances Syntonically, the progress has been noted subjectively, by visual acuity and by visual field charting. Now the Biophotometer serves as an additional check. However, there is sufficient evidence to believe that readings obtained must be interpreted according to the age of the patient. With the Biophotometer it is possible to rule out ocular symptoms which, while they might point to Vitamin "A" deficiency, may be of an entirely different origin and subject to Syntonic technique. In conclusion it may be stated that from all indications Vitamin "A" does not affect visual acuity; whereas, the importance of Syntonics in this respect cannot be overestimated. Moreover, Syntonics apparently play an important part in the assimilation of Vitamin "A" in the eye.

Case No. 1

October 23, 1937. Miss D. W. Age 10 years. Pyknic No glasses.

COMPLAINTS: Physician's advice to keep out of school for a month to two months. Extremely nervous. Eyes Burn continually. Unable to study.

Refraction showed +.50 sphere O.U. Visual Acuity 20/40 O.U.

VISUAL FIELDS		O.D.			O.S.		
		UP	DN.	OUT	UP	DN.	OUT
Green	Oct. 23,1937	6	5	8 degrees	9	7	8 degrees
Red		12	11	10	12	12	10
Blue		10	10	10	7	6	5
Form		9	7	9	9	9	9

Blind spot enlarged. 1 degree target used. Green and white appeared yellow.

My suggestion was to either give the patient Syntonic treatment or to stay with the physician for a while. They decided to go to the physician the same day.

On August 26, 1938, the child appeared for Re-examination.

COMPLAINTS: Same as previously

VISUAL ACUITY:		O.D. 20/80	O.S. 20/80
	September 6, 1938	20/20	20/20

BIOPHOTOMETER:	after bleach period	5.8 millifoot candle power
	August 30, 1938	1.48 millifoot candle power
	September 10, 1938	.69 millifoot candle power
	September 27, 1938	.44 millifoot candle power

VISUAL FIELDS:

		O.D.			O.S.			
		UP	DN	OUT	UP	DN.	OUT	TARGET
	1938							
Green	Aug. 26	9	9	11 degrees	8	9	9	1½ deg.
	Sept 2	17	24	25	16	18	26	1
	Sept 27	21	20	30	20	21	30	1
Red	Aug 26	9	9	10	8	9	9	1½
	Sept. 2	20	21	29	18	29	22	1
	Sept.27	23	22	33	23	32	24	1
Blue	Aug. 26	11	11	9	4	5	6	1 ½
	Sept. 2	19	20	27	17	20	26	1
	Sept. 27	25	25	34	25	25	29	1
Form	Aug. 26	12	11	12	11	11	13	1
	Sept. 2	23	24	30	21	24	25	1
	Sept. 27	25	25	25	25	24	25	1

On August 26, 1938, blind area was very much more enlarged than on October 22, 1937. September 2, 1938 blind sports were normal.

TREATMENTS: On August 26, 1938 to September 16, 1938, L- μυ alternated with N/L-μ. September 20, 1938 to October 20, 1938, N/L μδ with N/L- μ. 20,000 U.S.P. of Carotene prescribed daily.

COMMENTS: The child feels much better and happier. Has improved considerably in her school work.

CASE NO. 2

April 15, 1938. Mr. J.M. Age 34 years. Middle Type.

OLD Rx: O. D. -6.00 sphere O. S. -8.00 sphere -.75 cyl. ax. 18. Add +1.50
COMPLAINTS: Gradual loss of vision in left eye. Night-blindness. Poor coordination. Very Nervous. Slow reader.
BLOOD PRESSURE: Normal

VISUAL ACUITY:	O.D.	O.S.
	Light perception	20/20
April 29, 1938	Light perception	20/40
May 19, 1938	Light Perception	20/40+
May 24, 1938	Light perception	20/30
June 11, 1938	Light perception	20/30+
June 14, 1938	Light perception	20/25
August 20, 1938	Light perception	20/25

BIOPHOTOMETER:		
	after bleach period	5.0 millifoot candle power
	April 19, 1930	3.0 millifoot candle power
	April 25, 1938	2.9 millifoot candle power
	June 30, 1938	2.15 millifoot candle power

NEW Rx: -6.00 sphere O.S. -.25 +.75 x 90. Add +1.50 O.U.

VISUAL FIELDS:		O.D.			O.S.			
		UP	DN.	OUT	UP	DN.	OUT	TARGET
Green	April 15, 1938	3		degrees	3	3	3 deg.	2 deg.
	April 19, 1938				5	5	5	2
	May 3, 1938				8	8	8	2
	May 20, 1938				8	8	8	1 ½
	June 30, 1938				9	9	9	1 ½
Red	April 15, 1938				4	4	4	2
	April 19, 1938				5	4	4	2
	May 3, 1938				9	10	10	2
	May 20, 1938				9	9	9	1 ½
	June 30, 1938				10	10	12	1 ½
Blue	April 15, 1938				3	3	3	2
	April 19, 1938				4	2	2	2
	May 3, 1938				7	7	7	2
	May 20, 1938				7	9	7	1 ½
	June 30, 1938				7	8	7	1 ½

Form	April 15, 1938	7	6	7	2
	April 19, 1938	9	8	10	2
	May 3, 1938	10	10	15	2
	May 20, 1938	11	12	17	1 ½
	June 30, 1938	11	11	17	1 ½

TREATMENTS: April 15, 1938 to April 19, 1938, L- υω
April 19, 1938 to May 3, 1938, N/L- Δs
May 3, 1938 to May 20, 1938, L- μδ flash, alternated with μυ.
May 20, 1938 to June 30, 1938, L- μδ flash, alternated with αδ flash, and μυ. Carotene Intake 30,000 U.S.P. daily.

COMMENTS: Patient able to get around much better, does not falter. Night-blindness reduced considerably, but still bothered when driving at night. Nerves much better and reads faster.

CASE NO. 3

March 14, 1938. Mrs. F. S. Age 70 years. Asthenic
OLD Rx: O.D. +1.75 sph. +/50 cyl. x 100 O.S. +.50 sphere
COMPLAINTS: pain and drawing in the left eye. Unable to sleep at night for a number of years. Very eccentric. Extremely nervous. Posterior dull. Possible senile cataract.

BLOOD PRESSURE:	Sys. 200	Dia. 100
March 20, 1938	175	85
May 16, 1930	175	80
July 18, 1938	168	85

VISUAL ACUITY:	O.D. 20/30+	O.S. 20/60+
April 8, 1938	20/25	20/25
May 16, 1938	20/20	20/25
June 1, 1938	20/20	20/20-
July 10, 1938	20/25	20/25

BIOPHOTOMETER: (after blech period)	1.15 millifoot candle power
March 8, 1938	1.10 millifoot candle power
April 8, 1938	1.00 millifoot candle power
July 18, 1938	.69 millifoot candle power

New Rx: O.D. +2.25 sphere O.S. +1.25

VISUAL FIELDS:		O.D.			O.S.		
		UP	DN.	OUT	UP	DN.	OUT
Green:	March 14, 1938	2	2	2	5	5	4
	March 21, 1938	5	5	5	5	5	6
	April 22, 1938	10	11	13	12	12	11
	October 3, 1938	15	13	16	16	14	17

RED:	March 14, 1938	3	5	4	8	9	8
	March 21, 1938	10	12	13	9	13	30
	April 22, 1938	15	15	32	17	18	29
	October 3, 1938	16	16	20	20	20	20
Blue:	March 14,1938	No Blue			2	7	6
	March 21, 1938	4	4		5	4	7
	April 22, 1938	6	7	8	7	8	8
	October 3. 1938	10	20	19	18	21	31
Form:	March 14, 1938	5	7	5	11	11	11
	March 21, 1938	13	13	13	17	17	25
	April 22, 1938	20	24	35	23	24	35
	October 3, 1938	22	24	32	24	25	34

Blind spots were normal all the way through

TREATMENTS: March 14, 1938 to May 1, 1938. N/L-5' ωδ-3', αω
April 4, 1938 to April 10, 1938. L-2', μδ-3', μυ.
April 20, 1938 to May 6, 1938. N/L-2', υω-3', μυ.
May 9, 1938 to May 20, 1938. N/L-4', ωδ.
May 20, 1938 to June 20, 1938. L-4', μυ.

COMMENTS: Patient was discharged from June 20, 1938 to July 10, 1938. Very much satisfied. Feeling fine and happy. Patient was called back October 3, 1938. Still very well satisfied. No change in diet and no Vitamin "A" concentrate used.

CASE NO. 4

November 27, 1937. Miss D. W. Age 15 years. Pyknic.
OLD Rx: O.D. -.25 sphere O.S. -.37 sphere
COMPLAINTS: Glasses unsatisfactory. Prescribed by two oculists and one optometrists. Last Rx by an oculist. Frontal headaches after reading. Asthenopia.

VISUAL ACUITY: 20/20 O. U.

BIOPHOTOMETER:	(AFTR BLEACH PERIOD)	3.15 millifoot candle power
	November 26, 1937	1.35 millifoot candle power
	December 4, 1937	.84 millifoot candle power
	December 31, 1937	.76 millifoot candle power
	November 1, 1938	.63 millifoot candle power

NEW Rx: O.D. +.37 sphere O.S. +.37 sphere

VISUAL FIELDS:		O.D.			O.S.		
		UP	DN.	OUT	UP	DN.	OUT
Green	Nov.21, 1937	9	10	10	0	10	8
	Dec. 13, 1937	10	22	29	15	27	20
	Dec. 31, 1937	24	25	29	24	25	34

Red	Nov. 21, 1937	12	20	27	15	15	20
	Dec. 13, 1937	17	22	33	17	28	32
	Dec. 31, 1937	25	25	35	25	25	35
Blue	Nov. 21, 1937	7	7	7	4	6	8
	Dec. 13, 1937	14	23	32	14	21	30
	Dec. 31, 1937	25	25	35	25	25	35
Form	Nov 21, 1937	15	20	32	17	23	34
	Dec. 13, 1937	22	25	35	25	25	35
	Dec., 31, 1937	25	25	35	25	25	35

Blind spots normal.

		Break	Recovery
Nov. 27, 1937	Dist. AB.	C	4
	AD.	28	2
	Near A.B	24	20
	AD.	20	2-
Dec. 31, 1937	Dist. AB.	9	4
	AD.	32	12
	Near AB	22	10
	AD.	41	22

TREATMENTS: 4 of L- μυ; 2 of N/L- αω; 2 of L- μδ; and 3 of N/L-μ.
COMMENTS: Case completed, no lenses necessary. Patient has lost all difficulty with her eyes. 20,000 U.S.P. daily intake, of carotene.

CASE NO. 5

August 6, 1938. Miss L.B. Age 20 years. Pyknic.
COMPLAINTS: Headaches, eyes burn, photophobia.
Rx: O.D. +.25 cyl. x 110 O.S. +.25 cyl. x 90. No lenses prescribed.
BLOOD PRESSURE: Sys. 115. Dia. 70.
VISUAL ACUITY: 20/20 O/U.

BIOPHOTOMETER:	(after bleach period)	1.00 millifoot candle power
	August 20, 1938	1.00 millifoot candle power
	August 27, 1938	.84 millifoot candle power
	September 3, 1938	.44 millifoot candle power

VISUAL FIELDS:		O.D.			O.S.		
		UP	DN.	OUT	UP	DN.	OUT
Green	August 6, 1938	7	7	8	8	7	9
	August 23, 1938	15	17	29	16	17	24
	September 1, 1938	10	16	23	19	17	27
	September 6, 1938	21	23	31	22	21	20

Red	August 6, 1938	10	10	11	12	12	13
	August 23, 1938	17	23	31	17	21	29
	September 1, 1938	20	19	27	20	21	20
	September 6, 1938	23	25	32	23	23	30
BLUE	August 6, 19238	9	9	10	10	10	10
	August 23, 1938	17	21	30	17	19	25
	September 1, 1938	23	21	29	20	21	31
	September 6, 1938	25	25	35	25	25	33
Form	August 6, 1938	25	23	34	25	25	25
	August 23, 1938	21	25	24	21	22	30
	September 1, 1937	25	23	32	25	24	34
	September 6, 1938	25	25	35	25	25	35

Blind spots normal.

ABDUCTION AND ADDUCTION:		Break	Recovery
August 6, 1938	Dist. AB	8	4
	AD.	6	1
	Near AB	22	16
	AD	6	8-
September 30, 1938	Dist. AB	6	2
	AD	24	10
	Near AB	20	16
	AD	30	30

TREATMENTS: 5 of L- αω; 4 of N/L-μθ; 4 of L-θ; 2 of L- μυ.
Distance 36Δ out; near 50Δ.
Metronoscope base up and down and out.

COMMENTS: No further complains. No vitamin concentrate. Feeling very good. No glasses.

CASE NO. 6

August 29, 1938. Miss E. R. L. Age 1 ½ years. Asthenic.
COMPLAINTS: Amblyopia, slow reader.
OLD Rx: O.D. -3.50 sph. +3.50 cyl x 95 O.S. -3.50 sph +4.00 cyl x 90
VISUAL ACUITY:

	O.D	O.S.
August 29, 1938	20/40	20/40-
September 3, 1938	20/40+	20/25-
September 19, 1938	20/30	20/25

BIOPHOTOMETER: (after bleach period) 1.36 millifoot candle power
September 17, 1938 .76 millifoot candle power

VISUAL FIELDS:		O.D.			O.S.		
		UP	DN.	OUT	UP	DN.	OUT
Green	August 29, 1938	10	10	10 deg.	10	10	10 deg
	September 30, 1938	12	12	14	11	17	25
	October 11, 1938	15	17	21	14	11	24
	November 8, 1938	17	20	26	17	18	23
Red	August 29, 1938	10	10	10	10	10	10
	September 30, 1938	19	20	20	10	17	20
	October 11, 1938	10	15	22	10	15	25
	November 8, 1938	20	21	29	18	20	25
Blue	August 29, 1938	9	9	9	8	8	9
	September 30, 1938	14	14	18	15	17	26
	October 11, 1938	12	15	20	12	15	25
	November 8, 1938	23	23	31	22	20	25
Form	August 29, 1938	11	11	12	11	11	12
	September 30, 1938	20	20	29	29	19	29
	October 11, 1940	16	20	25	10	17	27
	November 8, 1938	25	25	33	25	25	31

Blind sports uncertain at first and enlarged. Now normal.

TREATMENTS: Metronoscope reading – prism out treatment.
7 treatments of N/L-μδ alternated with μ.
7 treatments of L-ω alternated with μδ.
6 treatments of N/L- μ alternated with αω.

COMMENTS: No Vitamin "A" taken. No change of lenses

COMMENT

Attention is directed to Dr. Rockwell's mention of the use of Vitamin "A" in a few of his case reports. The use of this product by optometrists must be governed by the local legal situation, and unless you are certain of your legal right to use it I would recommend that if the clinical picture indicates the need for Vitamin "A" that you have a cooperating physician work with you on its administration.

SUBJECT: Dr. Rockwell's paper, in this issue of the Syntonogram, sent to all members in good standing.

Comments by Dr. T. A. Elmgren, Columbia, S. Car.

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There has been volumes written on, “Why Vitamin ‘A’ deficiency causes night blindness”. This is a popular subject at present, brought about by the numerous motor accidents which occur between sundown and sunrise.

Optometric writers have contributed their share of information pertaining to the subject and Dr. Rockwell makes still further contribution to the knowledge on the subject by showing the influence of certain light frequencies “within the visual spectrum” upon the visual purple.

Dr. Rockwell’s paper and case histories are easily understood, as well as better appreciated by the practitioners who are well grounded in physiological optics.

If Vitamin “A” deficiency lowers the visual purple in the rods of the retina, we must also realize that other functions of the body are impaired or lowered. I am not, however, in full accord with Nagel that night blindness is a symptom of a number of ocular diseases.

As ocular practitioners, we are vitally interested in what to do for the patient to restore the lowered visual purple, realizing that there may not be comfortable “seeing” without a sufficient supply of the visual purple.

Let’s quote Helmholtz’s “Physiological Optics”, Vol. 2, page 11, “Light sensations due to internal conditions are varied”. On page 46: “There are certain positive effects produced in the retina that are manifestly dependent upon the action of light.” On page 52: “Visual purple cannot be detected by the ophthalmoscope in the living eye of either an or mammal”.

The above brief quotations brings us to the usefulness of the “Biophotometer[2], or “Adaptometer”, or any other instrument whereby the regeneration of the visual purple can be measured for recording, also to the techniques of applying different light frequencies known to us as syntonics, to bring about a restoration of the lowered visual purple, as revealed in Dr. Rockwell’s case reports.

It is interesting to note the relationship between the Biophotometric findings and the field charts. When one showed improvement, so did the other.

In checking the frequencies used by Dr. Rockwell, I am reminded of Nagel’s appendix to Helmholtz’s “Physiological Optics”, Vol. 2, page 302, from which I quote: “The reaction of the nightblind to the longer waves of red light is particularly remarkable and important theoretically.” Also on page 309: “Light which traverses the layer with its purple contents will undergo a partial absorption in the layers which it encounters first, and in fact those rays will be most absorbed, and consequently most enfeebled, that have the strongest simulating actions on the rods, namely the green rays.”

CONCLUSION: Those who are well informed on Physiological Optics are in accord with the Syntonic technique, and fully realize that Syntonic Optometry enables the Optometric practitioner to render a complete ocular service, excepting surgery.