DALTONIANA

NEWSLETTER
OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES
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ADMINISTRATIVE REPORT

The IRGCVD general assembly on June 25, 1985 in Avignon accepted the new by-laws (as published in nr. 54 of Daltoniana) and decided that

(1) Professor W. Jaeger (Heidelberg) will be president during the 1985-1989 quadriennum;

(2) the next (9th) international symposium will be held in Baltimore in the middle of 1987 at a time such that there should be no clash with the CIE meetings in Padova and Venice (June 10-25) and with the meetings of the german and swiss ophthalmological societies;

(3) the themes of this 9th meeting should be (a) Cortical structures and functions in colour vision, (b) Colour vision defects in dystrophic and degenerative retinal diseases, (c) Polymorphisms in normal colour vision; additional themes are (d) History of colour vision testing and (e) Colour vision testing by lanterns; all directorial members and the other members are requested to suggest invited speakers for these themes;

(4) the 10th international symposium will be held in 1989 in Cagliari (Sardinia, Italy) - Guy Verriest.

Standardization Committee

The results of the questionaire on illumination is included in this issue of Daltoniana and I would like to thank all those who took part.

I have recently received information from Mac Beth/Kollmorgen that the Mac Beth Easel lamp is still available. The cost in the U.K. is £450.

A copy of the Standardization Committee's report on Colour vision examination, which is being published in the

British Journal of Ophthalmic and Physiological Optics, will be sent to all members shortly. A further report intended for the Concilium Ophthalmologicum Universale is still in preparation.

In Avignon I decided to stand down as chairman of the Standardization committee. Dr. Joel Pokorny is the new chairman. - Jennifer Birch.

Finances

At the VIIIth Symposium in Avignon, it was decided to maintain the Annual Subscription at the present rate (£10) and to appoint Dr. Bruce Drum as regional treasurer for the U.S.A. It was decided to hold a separate account in the U.S.A. both in preparation for the IXth Symposium and for the convenience of members in this area. In the next month I will be posting requests for outstanding subscriptions and Dr. Drum will be contacting members in the U.S.A., Canada and South America about arrangements to pay subscriptions in Dollars. For payment in London I can accept Eurocheques payable in Sterling, and drafts drawn on a London bank (Add 20%) - Jennifer Birch (Hon. Treasurer).

THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

Statement of Income and Expenditure from July 1983, and Balance as of June 10th 1985.

Income and Expenditure from July 1983 to July 1984:

Current Account:

Income		Expenditure		
(Subs. 1983)	£1,258.69	Post & Mail		
		Subs. 1983	£45.30	
		Subs. 1984	34.27	
		Bank charges	5.70	
		Daltoniana (1)	317.18	
		Daltoniana (2)	333.59	
				736.04
		Excess of Income over expenditure		522.65
	£1,258.69			£1,258.69

Deposit Account:

Canadian Transfer	£2,790.24
Additional Transfer	8.45
Profit from VII Symposium	632.91
Interest	33.71
	£3,465.31

Total Balance at July 1984 - £3,987.96.

INCOME AND EXPENDITURE FROM JULY 1984 TO JUNE 10th 1985

Current Account:

Income		Expenditure	
(Subs 1984)	£882.64	Daltoniana (1)	£352.61
		Secr. Expenses	3.90
		Bank Charges	4.22
Transfer from Deposit Account	£1,000.00	500 Reprints	442.00
		Transfer to Deposit Account	500.00
			1,302.73
		Excess of Income over Expenditure	579.91
	£1,882.64		£1,882.64

Deposit Account:

As of July 1984	£3465.31
Interest (1)	94.34
Interest (2)	143.82
Transfer from Current Account	500.00
	£4,203.47
Less transfer to Current Account	1,000.00
	£3,203.47

Total Balance at June 10th 1985 - £4,306.03.

Excess of Income over expenditure 1984	£522.65
Excess of Income over expenditure 1985	579.91
Current account	£1,102.56
Deposit account	£3,203.47
	£4,306.03

J. Birch
Hon. Treasurer.

Illumination for colour vision tests. (A survey)

Jennifer Birch,
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The Standardization committee of the International Research Group on Colour Vision Deficiencies decided, at its VIIth Symposium in 1983, to make a survey of the illumination used by its members for clinical colour vision examinations. A questionaire was subsequently published in the Newsletter of the group. Thirty completed questionaires were returned. This is an analysis of the results.

Background

Thirty returned questionaires represent about 25% of the membership of the International Research Group. Sixteen different Nationalities are represented in the replies including the main European Countries, Scandinavia, America, Australia, Japan and the Eastern Block Countries. The proportional representation of different professions of the correspondents accurately reflects the interdisciplinary membership of the Group. (Table I).

Of the thirty people responding, eleven (all ophthalmologists) stated that their work was in clinical practice only and sixteen replied that, in addition, they were engaged in either teaching, research or both. Three correspondents were engaged in teach and research without clinical work. These were the psychologist, the geneticist and one of the physicists.

Patterns of Practice

Colour vision examinations were performed frequently by twenty-two of the respondents and occasionally by the remaining eight respondents.

Only five people said that they screened all their patients for defective colour vision. Seventeen replied that they made a colour vision examination when they considered it to be "clinically necessary". The remaining eight people communicated a variety of different reasons for deciding that an examination was required. These included referrals by other practitioners and a policy of screening young males only.

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All twenty-seven people, who performed clinical colour vision examinations, responded to the request to nominate a lower age limit for obtaining satisfactory results (Table II).

The majority considered that children could be examined successfully between 4 and 5 years of age and more than 80% of the respondents aimed to screen children for defective colour vision between the ages of 4 and 7 years. All the same twenty-seven people gave occupational advice to patients with defective colour vision. This advice was always based on the results of a colour vision test battery. Generally, this battery consisted of pseudoisochromatic tests, arrangements tests and an anomaloscope. However three practitioners were without an anomaloscope and therefore based their advice on results obtained with pseudoisochromatic plates and arrangement tests alone.

Colour vision lanterns were only used by two ophthalmologists and two optometrists and these were all of different manufacture.

Some I.R.G. members replied in a lot more detail than others when asked to list the colour vision tests they used. Some people obviously described the entire contents of their cupboards (including new tests at present being evaluated), while others merely listed their usual test battery. However the results are a useful indication of the popularity of different tests (Table III). In particular, all the respondents used the Ishihara plates confirming that this pseudoisochromatic test is the most useful one for initial screening. Of the arrangement tests the D15 panel was slightly more popular than the 100-Hue test for grading hue discrimination ability. The Nagel anomaloscope was also used frequently and was equal in popularity to the D15 panel in spite of its cost. An anomaloscope was considered to be essential for diagnosing the type of red-green defect. Some respondents used more than one anomaloscope and only three people were without an anomaloscope all together.

Fourteen of the thirty people replying to the questionaire described facilities for making psychophysical measurements to back up their clinical investigations. Twelve people described more than one clinical test location.

Illumination

A variety of illuminants were used for colour vision tests in the primary test location (Table IV). These could be divided into three groups of almost equal size. One third of the practitioners used the MacBeth Easel lamp, one third used artificial daylight fluorescent tubes and the remainder used either natural daylight alone or a combination of different light sources. Everyone aimed to obtain C.I.E. standard illuminant C (6,500°K) but the level of illumination was significantly higher in the group using fluorescent light sources. Twenty-two people replied that their illumination was between 300 and 500 lux, four people used between 500 and 1000 lux and four had between 1000 and 2000 lux. Of the seven people using natural daylight, or a combination of natural daylight and other sources, five had north sky illumination in the Northern hemisphere and one had south sky illumination in the Southern hemisphere. One person described use of East-West daylight.

Twenty people described their consulting room walls. Ten were white or near white, eight were grey, one was yellow and one was yellow and white.

Twenty-eight people confirmed that they took steps to ensure that their illumination remained constant and twenty-two replied that they had facilities for monitoring the illumination.

All the respondents were happy with their lighting conditions. Sixteen of the thirty respondents described themselves as "very satisfied" with their illumination and thirteen said that they were "satisfied". Although the individual practitioner using East-West natural daylight said that he was satisfied with his illumination he also expressed some unease that the window aspect was less than ideal. One person said that he was "dissatisfied" with his illumination on the ground that, although he used the MacBeth Easel lamp, he would prefer to use a much more expensive colour matching cabinet.

The survey revealed that twelve of the thirty correspondents had constructed their own standard illuminants either for the main or subsidiary test location. This included five people who had tried to buy a standard illuminant, presumably the MacBeth Easel lamp, and had been unable to do so. The same twelve people

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were prepared to state what an ideal illuminant should consist of, in terms of amount and spectral distribution, based on their own searches and experiences.

Finally, most of the thirty correspondents emphasised the importance of the illumination for obtaining consistent results in a colour vision examination. Sixteen people considered the illumination to be "very important" and thirteen considered it to be "important". One person replied that he thought the illumination to be "unimportant".

Discussion

The aim of the International Research Group is to disseminate information on the design and performance of clinical colour vision tests and to promote standardized test procedures. The illumination used for clinical tests is an important factor in maintaining the correct colour appearance and in stabilizing test performance. It is noticeable in this survey that all the respondents aim to have consistent lighting conditions and that they aim to control the spectral content of that illumination by using the equivalent of C.I.E. standard illuminant C. However the use of the fluorescent daylight tubes to achieve this, means that the illumination level has tended to increase. While most practitioners still aim to have between 300 and 500 lux. Some practitioners are now using over 1000 lux. Results obtained at these different levels of illumination may not be comparable especially when arrangement tests employing desaturated colours are used. It is therefore important that both the type and the level of illumination by specified when reporting results obtained with clinical colour vision test.

TABLE I

Professions of those responding to the I.R.C.G.A. questionnaire

Profession	Numbers
Ophthalmologists	18
Technicians working with Ophthalmologists	1
Optometrist	6
Physicist	3
Psychologist	1
Geneticist	1
TOTAL	33

TABLE II

The lower age limit considered by twenty-seven respondents to be appropriate for obtaining satisfactory results from a colour vision examination.

Lower age for obtaining reliable results	Number
4 - 5 years	16
6 - 7 years	6
8 - 9 years	0
9 -10 years	5
TOTAL	27

TABLE III

Frequency of use for individual colour vision tests

Test	Number of users (Maximum = 30)
a) Pseudoisochromatic tests	
Ishihara plates	30
6-0 H-R-R plates	14
F2 plate	6
Standard plates of Ichikawa I	5
Standard plates of Ichikawa II	5
Bostrom-Kugelberg plates	4
Dvorine plates	3
I.M.C. plates	2
Rabkin plates	2
Velhagen plates	2
Guy's colour vision test	1
b) Arrangement tests	
Farnsworth Panel D15	24
Farnsworth-Munsell 100-Hue test	20
Desaturated D15 test (Lanthony)	9
The 28 Hue test	2
The 40 Hue test	1
c) Anomaloscopes	
Nagel Anomaloscope	24
The Pickford-Nicolson Anomaloscope	5
The Besançon Anomaloscope	3
AN 59 (Soviet) Anomaloscope	1
d) Other tests	
The City University test	6
The New Colour Test of Lanthony	3
The Oscar test	2
The Sloan Achromatopsia test	2
Salmgrens Saturation test	1
The Color Aptitude test	1

TABLE IV

Illuminants used in the primary test location.

Illuminant	Number of users
Mac Beth Estel Lamp	11
"Daylight" fluorescent tubes	10
Natural daylight only	4
Natural daylight plus fluorescent illumination	3
Natural daylight plus Xenon illumination	1
Fluorescent plus incandescent illumination	1
TOTAL	30

LITERATURE SURVEY

A study of receptive fields of cat suprasylvian units during different wavelength stimulations, by A.R. KEZELI, Nejrofiziol., 14, 644-650, 1982.

Receptive fields of 83 units were studied in the lateral suprasylvian area (Clare-Bishop area) and in areas 17 and 18 in cats. Testing of the receptive fields of Clare-Bishop area units different wavelength spots showed that for more than 95% of them they remarkably varied during changes in colour. Under the same experimental conditions the receptive fields of units in areas 17 and 18 did not change. It is suggested that the Clare-Bishop area plays a major role in the colour vision of cats. - Marion Marré.

Xanthometry following the von Hess method, Determination of the blue absorption by yellowing of the crystalline lens (Die Xanthometrie nach v. Hess, Bestimmung der durch Gelbfärbung bedingten Blauabsorption der Augenlinse), by G. KLUXEN (Univ.-Augenklinik Düsseldorf, FGR), Die Farbe 31, 163-172,1983/84.

With a modified apparatus after v. Hess the absorption of short visible wavelengths in yellow-colored lenses was photometrically determined. During life the specific absorption for short wavelengths of radiation increases because of the continuous yellowing of the lens. The mean value of aphakic and pseudophakic eyes is used for reference. In brunescent cataract the specific absorption is above the value of normal lenses of the same age group; in patients with unilaterally implanted artificial lenses a marked difference of sensitivity between both eyes for the perception of blue light is found. - The Author.

Pseudoisochromatic plate design - Macbeth or tungsten illumination? by G.M. CHIORAN and J.E. SHEEDY (Ohio State Univ. Coll. Optom., Columbus, USA), Am. J. Optom. Physiol. Opt. 60, 204-215, 1983.

Three sets of pseudoisochromatic plates were evaluated by photometry and colorimetry. The luminance contrast between the figure and background was measured and compared with a contrast detection threshold. The chromaticity coordinates of the figure and background were evaluated on the basis of how closely they approached a dichromatic line of confusion. The separation of the coordinates of the figure and background are a measure of the severity of the defect for which the plate tests. The plates were evaluated under both Macbeth (C) and tungsten (A) illuminants; two sets of plates were found to be better designed for tungsten illumination. - The Authors.

The contribution of spectral increment thresholds to the interpretation of color perimetry, by H. KRASTEL, W. JAEGER and S. BRAUN (Eye Clinic of the Univ. of Heidelberg, FRG), Dev. Ophthal. 9, 171-181, 1984.

General description of the method for evidencing the three colour vision mechanisms by achromatic increment threshold perimetry with monochromatic targets on a white background. The effect of area is very well emphasized. - Guy Verriest.

Blue stimulus profiles in mesopic condition.I. Discussion of normal eye, by Y. YAMAZAKI, H. ABE and K. IWATA (Dept. Ophthalmol., Niigata Univ. School Med., Japan), Folia Ophthalmol. Jpn. 34, 2463-2467, 1983.

Recently Friedmann reported that, using the Friedmann Mark II, perimetry with a blue stimulus was more sensitive in detecting early visual field change in glaucoma. However, he could not explain the true mechanism. In an attempt to reveal this mechanism, we compared the white stimulus threshold with the blue stimulus threshold at various background luminances using the Friedmann M-II and Tübinger perimeters on normal eyes. The results obtained were summarized as follows : (1) With the Friedmann M-II, blue stimulus profiles in mesopic condition were similar to white stimulus profiles in scotopic condition; (2) With a white stimulus, transfer luminance from cone vision to rod vision ranged within 0.1 asb to 0.08 asb at nasal 5° and 20°; (3) With a blue stimulus, transfer luminance from cone vision to rod vision ranged within 0.16 asb to 0.08 asb at nasal 5°, and within 0.16 asb to 0.13 asb at nasal 20° : transfer luminance at nasal 20° shifted more photopically than at nasal 5° with blue stimulus; (4) According to blue stimulus profiles measured using the Friedmann M-II, photochromatic intervals were 0.2 log units within 10° from fixation point; however, they were more than 0.5 log units beyond 10° from fixation point.

These results may lead to the conclusion that blue stimulus profiles obtained using the Friedmann M-II indicate the simultaneous function of cones and rods in mesopic condition, rod function becoming predominant beyond 10° from the fixation point. - Yasuo Ohta.

Dichotomy of psychophysical responses in retrobulbar neuritis, by L. ALVAREZ (Dep. Ophthalm. Opt. Univ. of Manchester Inst. of Sci. and Technol., PO Box 88, Sackville Street, Manchester M60 IQD, U.K.) and P. Ewen KING-SMITH (Coll. Optom. Ohio State Univ., Columbus, OH 43210, U.S.A.).

Thirty cases of retrobulbar neuritis (RBN) with varying degrees of myelin loss have been analyzed in terms of loss of chromatic function, loss of spectral flicker detection and reduction in visual acuity. We suggest, from the preliminary results of this study, that there may be two distinct types or stages in RBN. Both stages include moderate to severe impairment or damage to the colour-opponent (and most likely the

fine-acuity) system. The second type or stage also involves a conduction block or failure, severely reducing sensitivity to fast flicker, although other luminance functions not involving fast-flicker detection may be spared. - The Authors.

Selective loss of chromatic sensitivity in demyelinating disease, by L. FOLLOWFIELD and J. KRAUSKOPF (Room 2C-548, AT&T Bell Lab., Murray Hill NJ 07974 U.S.A.), Invest. Ophthalmol. Vis. Sci. 25, 771-773, 1984.

Thresholds for detecting changes in color for isoluminant stimuli and for detecting changes in luminance were measured in patients with histories of demyelinating disease and in normal controls. Thresholds for detecting changes in color were higher for patient's affected eyes, that is, ones in which symptoms had been found previously, than in their unaffected eyes, or for eyes of control subjects. Thresholds for detecting changes in luminance were raised less than those for changes in color. The patterns of loss is different than that found in subjects with congenital color blindness. The results suggest that the impairment occurs at a level in the nervous system beyond which signals from more than one class of cone receptor are combined. - The Authors.

Defective colour vision : Fundamentals, diagnosis and management, by R. FLETCHER and J. VOKE, publ. Adam Hilger, Bristol, 1985. Hardcover, 608 p. £ 45/$ 67.50.

This essentially practical handbook fully reflects the wide experience the authors enjoy in the field of optometry and visual sciences.

It is mainly dedicated to optometrists, under graduate medical or optometry students, and all those professionals devoted to labor or community medicine as well as to the selection and guidance of personnel in the education, industry and safety areas.

Basically, the text offers a valuable approach to the detection, understanding and prognosis of the observer's visual capacities. After an introductory review of anatomical, physiological and psychophysical aspects of the visual system, including an extensive updated bibliography up to publication date, the authors deal with the subject of inherited and acquired defects in a lively, brisk and essentially practical way, special attention being placed on the effect chemicals and related substances may have on the vision.

This is followed by a commentary on the convenience and applicability of different testing methods currently used in Europe, the United States and Japan. Drawing on their large experience, they give specific advice for practitioners on the selection, use and interpretation of appropiate clinical tests, as demonstrated by the illustrative records of actual patients.

The chapter devoted to assistance to daltonics, clearly proves the interest of the authors to palliate color vision defects, always with the aim of obtaining a better performance from the patients. Defective children receive a very especial attention within this frame, as shown in the section where the authors present tests devised by themselves, which are easy to handle, understand and maintain, always emphasizing and explaining the importance an early diagnosis of the youngster's condition may have, in order to prevent greater damage and tending to develop a correct vocational guidance.

The vocational, industrial and safety subjects receive then a careful review, and a most interesting comparation among international standards for color vision is presented.

The book closes with a list of recommendations that clearly show the extent to which the authors are concerned with educational subjects and their desire to reveal and spread simple techniques with a view to a better understanding of different aspects of the color vision, not only pathological.

As explained by the authors in the introductory treatment, each chapter is in itself an independent self-contained thematic unit, fact that turns its selection more accessible according to the reader's interest.

The authors are active members of the International Research Group on Colour Vision Deficiencies. - Maria L.F. de Mattiello.

Color vision deficiencies (Kleurzienstoornissen), by D. VAN NORREN (RVO-TNO, Postbus 23, NL-3769 ZG Soesterberg, The Netherlands), Rapport IZF 1982-9

In this report a description is presented of congenital and acquired color vision defects in a context of physiological data. Further chapters are light sources, photometry, color systems and test methods. Also, the practical consequences of color vision deficiencies are discussed. - The Author.

OBITUARY

François PARRA

François PARRA died on June 8, 1985, one week before the AIC Congress in Monaco of which he was the chief organizer. After studies at the Institut d'Optique in Paris he became in 1956 assistant at the Oceanographic Institute and at the Laboratory of Applied Physics of the Muséum National d'Histoire Naturelle with Yves Le Grand. Colour vision was already his speciality and he obtained in 1966 the PhD degree with a thesis on chr matic differential thresholds. When Le Grand retired he became head of the laboratory. Parra's achievements are above all that of an excellent teacher and of a first-rank organizer. He represented France at the CIE and AIC congresses. He created the Centre Français de la Couleur and numerous other organizations.

He was member of the IRGCVD and presented papers at our three first international symposia. - Guy Verriest.

Gunter Wolfgang WYSZECKI

1925 - 1985

The President of the CIE, Dr. G.W. Wyszecki, died on 22 June 1985 after a long and severe illness. He was born in 1925 at Tilsit (Germany) and raised at Berlin. After wartime duty on a submarine, he attended the Technical University at Berlin where he studied mathematics with particular interest in descriptive geometry. For his doctorate thesis he chose color as the subject of application and received his Dr.-Ing. degree in mathematics and physics in 1953, working in part with Dr. Manfred Richter in the Color Research Laboratory of the Bundesanstalt für Materialprüfung. After graduation he was invited to spend a year as a Fulbright Scholar with Dr. Deane B. Judd at the NBS, Washington. Here he met Dr. W.E.K. Middleton of the National Research Council of Canada who invited him to join NRC.

In 1984 he was appointed Director of a proposed Institute for Optics of NRC.

The scientific work of Dr. Wyszecki resulted in over 85 papers and 8 books and was acknowledged in the Citation for the 1979 Deane B. Judd - AIC Award : "Dr. Wyszecki's researches in the fundamental science of color concerning such matters as color matching, color metamerism, and color discrimination and his accomplishments in bringing about international standardization in these and related areas of color science are along the contributions of this distinguished scientist that are noted here for recognition by the Association Internationale de la Couleur. ... His penetrating knowledge of the subject, meticulous experimental technique, lucid descriptions of results and acknowledged ability for organization and leadership have earned him the respect and admiration of colleagues and associates throughout the entire international color community". - From the CIE Newsletter.