

DALTONIANA

NEWSLETTER

OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

President: Prof. Dr. J. FRANÇOIS, Gent (Belgium)

Secretary for the Western Hemisphere:
Dr. R. LAKOWSKI
Department of Psychology, University of British
Columbia, VANCOUVER 8 (Canada)

General Secretary and Editor of the Newsletters:
Dr. G. VERRIEST
Dienst Oogheelkunde, Akademisch Ziekenhuis
De Pintelaan 135 - B-9000 GENT (Belgium)

Secretary for the Socialist Countries:
Dr. M. MARRE
Universitäts-Augenklinik, Fetscherstrasse 74
8019 DRESDEN (D.D.R.)

(Verantw. uitg.)

Tweemaandelijks Tijdschrift

Nr. 25 - 1st July 1976

LITERATURE SURVEY

No oblique effect in chromatic pathways, by D.H. KELLY
(Stanford Research Institute, Menlo Park, California, 94025),
J. opt. Soc. Amer. 65/12, 1512-1514, 1975.

The so-called "oblique effect" that horizontal and vertical lines are more visible than diagonal ones appears in flicker thresholds for luminous contrast gratings at all temporal frequencies but is absent in flicker thresholds for chromatic (red/green) gratings that are coarse enough to be fully resolved by the opponent-color pathways. These results demonstrate the fundamentally different properties of luminous and chromatic pathways. - Ingeborg Schmidt.

Visual detection analysed in terms of luminance and chromatic signals, by P.E. KING-SMITH (Ophthal. Opt. Dept., Univ. Manchester Inst. Science Technol., Po Box 88, Manchester M60 IQD, England), Nature 255, 69-70, 1 May 1975.

The comparison of the achromatic increment thresholds for objects of different wavelengths and durations on backgrounds of different luminances with the chromatic thresholds and with the thresholds for detecting 25 Hz flicker show that, according to the circumstances, the test flash is detected either by its luminance or by its colour; there even may be some probability summation between the two systems when they have nearly equal sensitivity. - Guy Verriest.

Monocular and binocular rivalry between contours, by N.J. WADE (Department of Psychology, University of Dundee, Dundee DD1, 4HN, Scotland), Perception 4/1, 85-95, 1975.

The temporal characteristics of binocular and monocular rivalry between orthogonal gratings of the same or complementary

colours were red and green or both red and both green. The total duration for which either grating was dominant was significantly longer in binocular and monocular rivalry between gratings of complementary colours than when they are the same colour, however in binocular rivalry dominance is associated with the visibility of one grating alone; in monocular rivalry dominance is associated with the increased distinctiveness of one set of contours and the reduced clarity of the others. - Ingeborg Schmidt.

Sinusoidal flicker characteristics of primate cones in response to heterochromatic stimuli, by R.M. BOYNTON and W.S. BARON (Center for Visual Science, University of Rochester, Rochester, New York 14627), J. opt. Soc. Amer. 65/10, 1091-1100, 1975.

On cynomolgous monkeys the foveal local ERG was recorded, which is dominated by the late receptor potential. Criterion-response threshold data were obtained for red, green and blue sinusoidally flickered test stimuli against complementary (cyan, purple and yellow) chromatic adapting backgrounds. The results support the hypothesis that a) the shapes of the modulation transfer functions (MTF) of the red and green cones systems are identical and are determined by the photoreceptors at high frequencies and b) the blue cones have an MTF with a lower corner frequency. - Ingeborg Schmidt.

Hue discrimination, by K.J. BOWMAN (Victorian College of Optom., Univ. Melbourne, Australia), Austral. J. Optom. 59, 42-52, 1976.

This is an excellent survey paper covering all aspects of the spectral hue discrimination curve : the different measuring methods (including Boynton's colour-naming technique), the influences of field size, retinal illuminance, eccentricity, fixation, adaptation, age, Stiles-Crawford effect, waveband width and exposure time, as well as the comparison of the results obtained in normal and in congenitally colour defective observers. 8 fig. and 75 ref. - Guy Verriest.

Color vision and brightness discrimination in two-month-old human infants, by D.R. PEEPLES and D.Y. TELLER (Psychology Dept., Univ. of Washington, Seattle 98195), Science 189, 1102-1103, 1975.

Infants showed capacity for at least dichromatic color vision and sensitive brightness gradation perception. - From Rev. sens. Disab., n° 22, 1975.

Separation of carriers of color vision defect with flicker photometry, by M. IKEDA (Imaging Science and Engineering Lab. Tokyo Institute of Technology), K. HUKAMI (Dept. of Ophthal., Kyoto Pref. Univ. Med.) and M. URAKUBO (Minolta CameraRes. Lab. Osaka), Acta chromat. 2, 217-221, 1974/75.

A modified heterochromatic flicker photometry was applied to 17 normals, 8 protans, 20 deutans, 4 proto-heterozygotes and 12 deuterio-heterozygotes. Two settings for minimum flicker perception, without an adapting field (H_0) and with a red adapting field (H_r) were obtained. Protans and deutans were clearly separated from normals. Some carriers of protanomaly (and protanopia) and of deuteranomaly (and deuteranopia) widely deviated from normals and the possibility of separating carriers of colour vision defect was shown. - Guy Verriest.

Acquired blue-yellow colour vision deficiencies (Dyschromatopsies acquises d'axe bleu-jaune), A. PINCKERS (Dept. of Ophthal., Univ. Nijmegen, The Netherlands), Ann. Oculist. (Paris) 208, 659-666, 1975.

77 cases were selected by means of the diagnostic BY of the AO H-R-R series, which are considered as the most valuable test, as only 70% of the cases were confirmed by the 100 hue, 40% by the Panel D-15 and 11% by Farnsworth's Tritan Plate. The deficiency axis as given by the AO H-R-R was tritan in 74 cases and tetartan in only 3 cases (a.o. 1 case of dominant juvenile optic atrophy). The survey of the causal diseases shows that the aetiologies of acquired blue-yellow deficiencies are the "pre-receptor changes in the widest sense": cataract, corneal dystrophies, retinitis pigmentosa, macular changes (but never Stargardt's disease!), choroidal changes, diabetes, a few cases of optic disease. - Guy Verriest.

Incomplete rod achromatopsia-like color vision in a progressive macular degeneration, by I. IINUMA (Department of Ophthalmology, Wakayama Medical College, Wakayama, Japan), Folia ophthal. jap. 25, 151-156, 1974.

An 18-year old boy came to the clinic with a complaint of strong dyschromatopsia and progressive amblyopia. The corrected visual acuity of both eyes was 0.1 in a usual illumination. The fundi showed progressive macular degeneration. Color vision, tested by (1) color naming method against the spectral and standard pigment colors (2) pseudoisochromatic charts of Ishihara, Okuma, TMC, and HRR, (3) dichotomous test of Farnsworth, and (4) Nagel anomaloscope model I, was indistinguishable from that of incomplete rod achromatopsia. He had other symptoms of day-blindness as the best visual acuity was 0.15 at 20-70 lx and as maximal luminosity in the spectrum felt at 510 nm either in scotopic or photopic conditions. For the differential diagnosis between the two diseases, the remarkable symptoms were (1) no nystagmus, (2) absent photopic ERG and reduced scotopic ERG, and (3) central scotoma. But the most noteworthy points were the progressive history and fundus changes. - Yasuo Ohta.

Premacular fibrosis syndrome, by K. PECOLDOWA and P. MEDGE, Klinika Oczna 10/11, 1197-1201, 1975.

On the basis of 21 cases (24 eyes) the authors describe the primary and secondary forms of Jaffe's syndrome. They discuss the etiology and present the results of functional examinations (photopic and mesopic visual acuity, campimetry in photopic and mesopic illumination, color vision) in different phases of development of the disease. It was confirmed that this syndrome leads to disturbances in penetration of impulses through the preretinal membrane in the macular region, and that it does not lead to any lesion of the retinal receptor cells. - F. Jakubik.

The electroretinogram in dogs with inherited cone degeneration, by G.D. AGUIRRE and L.F. RUBIN (School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa, 19174), Invest. Opth. 14/11, 840-847, 1975.

Electroretinograms were measured on a strain of Alaskan malamute dogs which were day blind but had normal night vision and had no ophthalmoscopically visible abnormalities. The inheritance was simple autosomal recessive. Histologic and structural studies of the retina indicate that in adult affected animals there are no identifiable cones but the rods and the inner retinal layers are normal. The ERG shows absence of the photopic b-wave which is normally elicited with red light stimuli during dark adaptation. With flicker stimulation in dark adaptation only the first or rod branch of the flicker-fusion response curve is present. At higher intensity levels the flicker response is absent. A normal ERG is recorded using blue light stimuli and low intensity white light. - Ingeborg Schmidt.

Recognition of traffic signals viewed through colored filters, by R.A. PHILLIPS and W. KONDIG (Foster Grant Co. inc. 1 Leominster, Mass. 01453) J. opt. Soc. Amer. 65/10, 1106-1113, 1975.

Experiments were carried out to provide an empirical basis for establishing color standards for sunglasses. 19 individuals diagnosed by the FM 100 Hue test and the HRR plates, among them 9 normals, 3 protans, 6 deutans and one tritan, participated in the study. 42 filters were selected for the study including commercially available sunglass lenses, Kodak Wratten filters and Corning glass color filters. The experiments were conducted near an intersection on traffic signals, on sunny days, between 10 a.m. and 3 p.m. The observer had to state what color he saw when looking through the filter. Reflected light from a distant white building provided the light of illuminant D₆₅, which served as a standard background for the signals. The results are listed in tables. The results obtained from color deficient are not discussed separately. No limits on the apparent color shift for the amber and green signals as well as for D₆₅ are presented on a 1931 chromaticity diagram. Limits on the reduction in the apparent luminosity for each of the three signals are given in terms of the minimum transmittance of a lens for each signal. -Ingeborg Schmidt.

Dependence on colour environment of the influence of noise and vibrations, by J. REWKOWSKA, Bulletin of Information, Professional Re-establishment of Disabled persons, N° XLIV Warsaw, page 22-23, 1975.

Sixteen persons, 16-17 y old and having normal hearing and sight, were examined under noise and vibrations of definite frequency, amplitude and level in the environment of different colour screens : white, green, yellow, red. Each screen measured 3m x 3m and was placed at the distance of 50 m of the examined subject.

Before and after the action of noise and vibrations the following physiological parameters were measured : the vibratory and the ear sensibility, the hearing threshold, the sensorimotoric reaction time. 1. The noise and vibrations load causes restraint to the central nervous system; 2. yellow and green screens don't influence the processes of restraint; 3. the red screen disturbs the development of the restraint. The results of these examinations may be elaborated as the instructions concerning the colours of the production rooms depending on noise and vibrations.-
F. Jakubik.

AVAILABLE COLOUR VISION TESTS AND ACCESSORIES
GERMAN FEDERAL REPUBLIC (1976)

Ishihara, 1973 ed.	DM	106.-
Velhagen (Verlag VEB Georg Thieme, Leipzig, 1974)	DM	45,-
Panel D-15	DM	348,-
100 hue	DM	1047.-
Nagel anomaloscope (Firma Schmidt & Haensch, Naumannstrasse 33, 1000 Berlin 62)	DM	7020.-

P. Grützner

LISTS OF THE PUBLICATIONS ON COLOUR VISION
DEFICIENCIES OF MEMBERS OF THE RESEARCH GROUP

57. Papers by Prof. K. VELHAGEN (Dornröschenstrasse 19, 1172 BERLIN-KOPENICK, D.D.R.).

VELHAGEN K. - Das praktische Farbenerkennungsvermögen farbenuntüchtiger Personen für Signale des Luftverkehrs. Klin. Mbl. Augenheilk. 96, 442, 1936.

VELHAGEN K. - Die hypoxämische Farbenasthenopie, eine latente Störung des Farbensinnes. Arch. Augenheilk. 109, 605, 1936.

VELHAGEN K. - Zur Frage der Farbentüchtigkeit im Luftverkehr. Luftfahrtmed. Abhandl. 1, 127, 1936.

VELHAGEN K. - Weitere Untersuchungen über die Brauchbarkeit von Neophangläsern bei angeborener Farbenuntüchtigkeit. Klin. Mbl. Augenheilk. 96, 660, 1936.

VELHAGEN K. - Zur Frage der Farbenasthenopie. Ber. dtsh. ophthal. Ges. 51, 386, 1936.

VELHAGEN K. - Sehorgan und Luftfahrt. D. Dtsch. Militärarzt 1, 207, 1936.

VELHAGEN K. - Das Sehorgan in der Luftfahrtmedizin. Zbl. ges. Ophthal. Grenzgeb. 39, 195, 1938.

VELHAGEN K. - Medicina de Aviacion y el Ojo. El Dia Medico 10, 14, 1938.

VELHAGEN K. - Farbensinnstörungen und ihre Beurteilung. Neue Dtsch. Klinik, Erg. Bd. 9, 311, 1939.

VELHAGEN K. - Zur Frage der Farbentüchtigkeit im Strassenverkehr. Klin. Mbl. Augenheilk. 104, 377, 1940.

VELHAGEN K. - Tafeln zur Prüfung des Farbensinnes. 21. Aufl. Leipzig 1952; 22. Aufl. Leipzig 1963; 23. Aufl. Leipzig 1965; 24. Aufl. Leipzig 1967; 25. Aufl. Leipzig 1975.

CONTENTS OF THE PROCEEDINGS OF THE 3RD SYMPOSIUM
OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION
DEFICIENCIES (Amsterdam/Leiden, 1975).

(In press under the title COLOUR VISION DEFICIENCIES III
as vol. 17 of Mod. Probl. Ophthal., Karger, Basel, 1976).

Mechanisms of Defective Colour Vision

- WALRAVEN, P.L. (Soesterberg) : Basic Mechanisms of Defective Colour Vision.
- TRICK, Gary; GUTH, Sherman L., and MASSOF, ROBERT (Bloomington, Ind./Baltimore, Md.) : Wavelength Discrimination in Protanopes and Deuteranopes.
- SCHEIBNER, H. (Düsseldorf) : Missing Colours (Fehlfarben) of Deuteranopes and Extreme Deuteranomalous Observers.
- NORREN, DIRK V. and BOUMAN, M.A. (Soesterberg/Utrecht) : Is it Possible to Isolate Fundamental Cone Mechanisms with Wald's Method of Chromatic Adaptation?
- ESTEVEZ, O. and CAVONIUS, C.R. (Amsterdam) : Electrophysiological-ly Determined Spectral Sensitivities of the Colour Mechanisms of Normal and Dichromatic Subjects.
- CAVONIUS, C.R. and ESTEVEZ, O. (Amsterdam) : Flicker Sensitivity of the Long-Wavelength Mechanisms of Normal and Dichromatic Observers.
- LAKOWSKI, R. and CREIGHTON, D. (Vancouver, B.C.) : Foveal Chromatic Dark Adaptation Functions of Red-Green Deficient Subjects.
- COBB, Stephen R. (Glasgow) : A New Visual Pigment Model to Account for Colour Vision Defect.

Peripheral Colour Vision

- TREZONA, P.W. (London) : Aspects of Peripheral Colour Vision.
- GRAHAM, Een V. (Montreal, P.Q.) : Mechanisms of Peripheral Colour Vision.
- MASSOF, Robert W. and GUTH, Sherman L. (Baltimore, Md./Bloomington, Ind.) : Central and Peripheral Achromatic Points in Protanopes and Deuteranopes.
- DRUM, Bruce A. (Washington, D.C.) : Chromatic Saturation Derived from Increment Thresholds for White and Colored Targets. A technique for Projection Color Perimetry.
- MAIONE, M.; CARTA, F.; BARBERINI, E. and SCOCCIANTI, L. (Parma) : Achromatic Isopters on Coloured Background in Some Acquired Colour Vision Deficiencies.

Genetics of Colour Vision

- WENT, L.N. and DE VRIES-DE MOL, E.C. (Leiden) : Genetics of Colour Vision.
- ARIAS, Sergio (Caracas) : Genetic Hypotheses Induced by Unusual Colour Vision Phenotypes.
- JAEGER, W. and LAUER, H.J. (Heidelberg) : Non-Allelic Compounds of Protan and Deutan Deficiencies.
- KINNEAR, P.R.; SMITH, B.R. and COPLAND, D.R. (Aberdeen) : A family with Congenital Deutan and Tritan Defects.
- NEUHANN, T.; KALMUS, H., and JAEGER, W. (Heidelberg/London) : Ophthalmological Findings in the Tritans, Described by WRIGHT and KALMUS.
- JAEGER, W. and SCHNEIDER, V.J. (Heidelberg) : Colour Vision Deficiencies and Haemophilia.
- GRUTZNER, P.; BORN G., and HEMMINGER, H.J. (Darmstadt) : Coloured Stimuli within the Central Visual Field of Carriers of Dichromatism.
- IINUMA, Iwao and HANDA YOSHITOSHI (Osaka-fu) : A Consideration of the Racial Incidence of Congenital Dyschromats in Males and Females.
- HAUGHEY, Alan and HAUGHEY, Anneliese E. (Blanesfield, Stirlingshire) : A Study of Colour Vision Defect in a Valley Population in the West of Scotland.
- KOLIOPOULOS, J.; IORDANIDES, P.; PALIMERIS, G., and CHIMONIDOU, E. (Athens) : Data Concerning Colour Vision Deficiencies amongst 29,985 Young Greeks.

Methods of Examination

a) Psychophysical

- LAKOWSKI, R. (Vancouver, B.C.) : Objective Analysis of the Stilling Tables.
- NEUBAUER, O. and HARRER, S (Vienna) : Tritan Defects Found by Using Velhagen's Pseudoisochromatic Plates (24th edition)
- PINCKERS, A. (Nijmegen) : The Umazume-Ohta Test.
- HANSEN, Egill (Oslo) ; The value of Tissue Paper Contrast Test.
- MATTIELLO, Maria L.F. DE and GONELLA, Alejandro (Buenos Aires) : Size and Desaturation Scales in Test for Diagnosis of Color Vision Deficiencies
- PARRA, F. (Paris) : Determination of Confusion Lines with Neutral Band of Spectrum and Farnsworth Test.
- BIRCH-COX, Jennifer (London) : Design of Diagnostic Test for Congenital and Acquired Colour Vision Defects.
- FLETCHER, R. (London) : Multi-Colour Tests for Abnormal Colour Vision.
- GUILINO, G. and WIECZOREK, H.-L. (Munich) : A New Screening Method for Detecting Colour Vision Deficiencies.
- VOGT, Guido (Berlin) : Spectral Mixture Curves with Interference Filters for Dichromatic and Anomalous Trichromatic Subjects of the Red/Green Type.

VOS J.J. (Soesterberg) : Summary of the Report of the Working Party on Standardization of the International Research Group on Colour Vision Deficiencies.

b) Objective

MORELAND, J.D.; KOGON, D., and SMITH, S.S. (Waterloo, Ont.) : Optokinetic Nystagmus. An Objective Indicator of Defective Colour Vision.

HEDIN, A. and GLANSHOLM, A. (Stockholm) : Pupillary Spectral Sensitivity in Normals and Colour Defectives.

YORKE, Humphrey C. (Birmingham) : Use of the Rayleigh Equation as an Objective Determinant of Colour Vision Defects.

ZRENNER, E. and KOJIMA, M. (Bad Nauheim/Frankfurt a.M.) : Visually Evoked Cortical Potential (VECP) in Dichromats.

Acquired Defects

a) Experimental Aspects

SMITH, Vivianne D.; ERNEST, J. TERRY, and POKORNY, Joel (Chicago, Ill.) : Effects of Hypoxia on FM 100-Hue Test Performance.

ZWICK, HARRY and HOLST, Gerald C. (San Francisco, Calif./ Philadelphia, Pa.) : Experimental Alteration of the Red Cone Photoreceptor Process.

HILL, Adrian R. and STEVENSON, R.W.W. (Glasgow) : Long-Term Adaptation to Ophthalmic Tinted Lenses.

b) Clinical Aspects

ALPERN, M.; BASTIAN, B.; PUGH, E.N. jr., and GRAS, W. (Ann Arbor, Mich.) : Altered Ocular Pigments, Photostable and Labile. Two Causes of Deuteranomalous Trichromacy.

TAYLOR, W.O.G. (Ayr) : Albinism and Colour Defects.

VASSILIOU, G.; SIMONETOS, G., and KASTRANTAS, A. (Athens) : Colour Vision Deficiencies in Young Diabetics.

MARMION, V.J.; YURDAKUL, S., and KEELY, E.A. (Bristol) : Genetic Correlation of Diabetic Exudative Retinopathy.

LAKOWSKI, R.; DRANCE, S.M., and GOLDTHWAITE, D. (Vancouver, B.C.) : Chromatic Extrafoveal Dark Adaptation Function in Normal and Glaucomatous Eyes.

MAILATH, L. (Debrecen) : Examination of Chromatic Adaptation.

OHBA, N.; IMAMURA, P.M., and TANINO, T. (Tokyo) : Colour Vision in a Pedigree with Autosomal Dominant Optic Atrophy.

WILDBERGER, H.G.H. and LITH, G.H.M. van (Rotterdam) : Color Vision and Visually Evoked Response (VECP) in the Recovery Period of Optic Neuritis.

BIRCH-COX, Jennifer (London) : A Case of Acquired Tritanopia.

OHBA, N. and TANINO, T. (Tokyo) : Unilateral Colour Vision Defect Resembling Tritanopia.

Other Subjects

- SPERLING, H.G.; PIANTANIDA, T.P., and GARRETT, D.S. (Houston, Tex.) : An Atypical Color Deficiency with Extreme Loss of Sensitivity in the Yellow Region of the Spectrum.
- OHTA, Yasuo and KATO, Haruo (Tokyo) : Colour Perception Changes with Age. Test Results by P-N Anomaloscope.
- DAVIDOFF, J.B. (Swansea) : Hemispheric Differences in Hue Discrimination.
- YAGER, Dean and LAPIERRE, Nicole (New York, N.Y.) : Color and Movement are Processed Separately : Psychophysical Evidence.
- COHEN, Joseph D. (South Hadley, Mass./Kyoto) : Diagnosis of Color Vision Deficiencies in Learning-Disabled Children.

Subject Index.

ANNOUNCEMENTS

A NEW JOURNAL : COLOR RESEARCH AND APPLICATION

This newquarterly journal is published by Wiley-Interscience, a division of John Wiley and Sons (New York), and is endorsed by the Inter-Society Color Council, the Colour Group (Great-Britain) and the Canadian Society for Color, of which the members will be granted a special rate of US \$ 15 per year instead of the regular subscription price of US \$ 30. As the leaflet announced that the journal is written for "whoever is involved with color, within in business, education, art, design, or industry", I asked more information from the editor-in-chief, Dr. Fred W. BILLMEYER jr., Dept. of Chemistry, Materials Research Center, Room 217, Rensselaer Polytechnic Institute, TROY N.Y. 12181, U.S.A.

He answered to me in his letter of 14th may 1976 :

"... I hasten to assure you that we are interested in receiving papers concerning color vision. We are aware of course of the International Research Group on Colour Vision Deficiencies, and... I would welcome the opportunity to publish announcements of your symposia and other news items..." - G. Verriest.

XVth ISCERG SYMPOSIUM

The XVth Symposium of the International Society of Clinical Electoretinograpy will be held in Ghent (Belgium) from 20 to 23 june 1977, this period being choosen in order that the people also interested in our 4th Symposium of the International Research Group on Colour Vision Deficiencies in Parma (Italy) from 27 to 30 june 1977 could easily attend the two meetings.

The topic of the ISCERG Symposium is "Electrodiagnosis and toxic effects in vision". The invited speakers are DESMEDT (Brussels), POTTS (Louisville), KOLDER (Iowa City) and HONDA (Kyoto).

Further information can be obtained from the secretary of the symposium : Dr. A. DE ROUCK, Dienst Oogheelkunde, Akademisch Ziekenhuis, De Pintelaan 135, B-9000 GENT, Belgium.

SYMPOSIUM ON COLOUR EDUCATION

This 1 1/2 day symposium on 1st and 2nd october 1976 to be held at the Normandy Hotel, Renfrew (Scotland) will include papers both on aspects of the use of colour in education for teachers and educationalists in addition to covering the basic principals of colour science, language and technology for artists, designers and colour technologists.

Further details and application forms for registration may be obtained from the Hon. Secretary of the Colour Group (Scottish Section) : Dr. A.R. Hill, Glasgow College of Technology, Department of Ophthalmic Optics, North Hanover Place, GLASGOW G4 OBA, Scotland.

2ND SYMPOSIUM OF THE INTERNATIONAL PERIMETRIC SOCIETY

(Tübingen, 19-22 September 1976)

LIST OF THE COMMUNICATIONS IN THE SESSION ON COLOUR PERIMETRY (Chairman : G. VERRIEST)

- "Chromatic, high luminance Goldmann perimeter", by R. Lakowski, W. Wright & K. Oliver.
- "Spectral increment thresholds on a white background in different age groups of normal subjects", by G. Verriest.
- "Spectral increment on a white background in acquired ocular disease", by G. Verriest & A. Uvijls.
- "Absolute threshold for monochromatic stimuli of various size and duration across the visual field", by L. Rositani-Ronchi & F. Galassi.
- "The results of a comparison between the 100 hue test and static color perimetry", by V.J. Marmion.
- "The clinical assessment of the peripheric color vision", by M. Malone.
- "Kinetic meridional thresholds at three luminance white backgrounds (photopic, mesopic, scotopic)" by J. Vola, J. Jayle, J. Saracco, M. Chauvet & Cl. Magis.
- "Color perimetry parameters", by T.J. Carlow, J. Flynn & T. Shipley.
- "Investigation of retinitis pigmentosa by use of specific quantitative perimetry", by E. Hansen.

FOURTH SYMPOSIUM OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR
VISION DEFICIENCIES

PARMA (ITALY), 27th - 30th JUNE 1977

PRELIMINARY INSCRIPTION FORM

(to be detached from one the 1976 issues of Daltoniana and
to be returned before 31st December 1976 to
Dr. G. VERRIEST, Dienst Oogheelkunde, Akademisch Ziekenhuis,
De Pintelaan 135, B-9000 Ghent, Belgium).

The special themes of this symposium will be :

1. Neurophysiological approach of colour vision and its deficiencies (inv. speaker : H. SPERLING)
2. Colour vision under reduced illumination (inv. sp. : K. RUDDOCK)
3. Practical aspects of colour vision deficiencies (inv. sp. :
B. GRAMBERG-DANIELSEN and J. VOKE)

Free papers will be accepted (methods of examination of central
and peripheral colour vision, congenital and acquired defects,
genetics of colour vision etc.).

All papers must be written in good English.

Furthermore the authors are asked :

- a) to send before 1st March 1977 two copies of a summary of at
most 200 words to Dr. G. VERRIEST;
- b) to insert for their oral presentation slides with (English)
text intended to render the subject more understandable for
the non-English-speaking people;
- c) to remit before the end of the symposium the manuscript to
be printed in the Proceedings (taking into account the in-
structions made by KARGER).

PAPER AUTHOR(S) :
(one per form)

TITLE :
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THEME : 1 2 3 free

WANTED DURATION OF ORAL PRESENTATION :
5 min 10 min 15 min

For further information concerning the scientific program-
me contact Dr. G. VERRIEST; for the other matters contact Prof.
Dr. M. MARIONE, Clinica Oculistica dell'Università, I-43100 PARMA,
Italy.

(Only for not members) Please inscribe me as member of the
International Research Group on Colour Vision Deficiencies.

(name)
(full address)