# DALTONIANA

NEWSLETTER
OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

President: Prof. W.D. WRIGHT (U K.)

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)
(verantw. uitg.)

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

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IN THIS ISSUE YOU WILL FIND THE PROVISORY SCIENTIFIC PROGRAMME OF THE 7TH INT. IRGCVD SYMPOSIUM IN GENEVA.

PLEASE CHECK IF YOUR PAPER IS INCLUDED. FIFTEEN MINUTES ALLOTED TIME MEANS TEN MINUTES SPEAKING TIME AND 5 MINUTES DISCUSSION, WHILE TEN MINUTES ALLOTED TIME MEANS ONLY FIVE MINUTES SPEAKING TIME (FOR POSTERS AND SHORT PAPERS). MANUSCRIPTS FOR THE PROCEEDINGS ARE REQUIRED ALSO FOR THE POSTERS.

"S" MEANS THAT A SUMMARY WAS ALREADY RECEIVED. ALL OTHER AUTHORS (ALSO OF POSTERS) ARE REQUIRED TO SEND THEIR SUMMARY TO PROF. ROTH BY RETURN OF MAIL.

Mrs. Birch, Mr. Grützner, Mr. Hedin, Mr. Lakowski, Mr. Lanthony, Mrs. Marré, Mrs. Smith, Mr. Sperling, Mr. Ohta, Mr. Verriest, Mr. Went and Mr. Wright HAVE TO BE PRESENT ALREADY ON WEDNESDAY AFTERNOON FOR THE CLOSED MEETING OF THE DIRECTORIAL COMMITTEE.

Mr. Cavonius, Mr. Jacobs, Mrs. Marré, Mr. Mollon, Mr. Roth, Mr. Wright and Mr. Zrenner HAVE BEEN CHOSEN AS CHAIRMEN. THEY HAVE TO WRITE IF THEY CANNOT ATTEND THE RELEVANT SESSION.

Guy Verriest.

Spectral sensitivity of the peripheral retina to large and small stimuli, by Th. K. KUYK (Department of Psychology, Florida State University, Tallahassee, FL. 32306, U.S.A.), Vision Res. 22, 1293-1297, 1982.

Increment-threshold spectral sensitivity functions were taken foveally and at 4 other retinal locations with different sized test stimuli. For the fovea and parafovea at 4°, a 1°, 250 msec stimulus of variable wavelength, flashed on a 1000td white background yielded spectral sensitivity curves with three distinct maxima located near 455, 530-540 and 600 nm. As eccentricity increased so did the minimum spot size needed to produce spectral curves with three peaks. In particular, the 2°10' spot at 20°, 4°10' at 30 and 5.5° at 45° gave this result. Smaller stimuli in the periphery yielded curves with a minor peak at 455 nm, present under some conditions, and a major broad peak at 560 nm that resembled the CIE photopic luminosity function. Two different systems subserve detection : the three-peaked curves indicate mediation by the opponent-color system while the other type of function can be attributed to the non-opponent system. - The Author.

Saturation and adaptation in the rod system, by E.H. ADELSON (Vision Res. Lab. Univ. of Michigan, Dept. of Psychol. Ann Arbor, MI 48109, U.S.A.), Vision Res. 22 1299-1312, 1982.

A background that is briefly flashed to a dark-adapted eye saturates the rod system. This transient saturation occurs with backgrounds that are as much as 2 log units dimmer than those producing saturation under steady viewing. Rod threshold is highest when the background is first turned on, and falls as adaptation proceeds. The nature of the adaptive processes are studied by presenting flashed backgrounds on pre-adapting fields. The data can be interpreted in terms of two adaptive processes : the first is multiplicative, and occurs rapidly; the second is subtractive, and occurs more slowly. - The Author.

Changes in perceived color due to chromatic interactions, by C. WARE and W.B. COWAN (Optics Section, Division of Physics, National Research Council of Canada, Ottawa, Canada K1A OR6), Vision Res. 22, 1353-1362, 1982.

Studies of chromatic induction have generally examined either (a) the effects of a chromatic surround on a neutral test field, or (b) the effects of one spectral hue on another. To investigate how colors interact in other regions of color space an experiment was designed using 15 test stimuli scattered through C.I.E. color space. The perceived hue of each stimulus was matched on its own and in the presence of five inducing stimuli. Matching was done both with and without a lens to correct axial chromatic aberration, which was found to be a significant pre-

receptoral factor influencing perceived colour. With chromatic aberration corrected the overall pattern of chromatic changes can be explained neither by receptor processes alone, nor by opponent channel processes alone. But a reasonable fit can be obtained if changes are allowed to take place in both levels of the s stem. - The Authors.

Aging macular pigment density and visual sensitivities, by T. YASUMA, F. TORII and H. ICHIKAWA (Dept. of Ophthalmol., Nagoya University School of Medicine, Japan), Jap. J. Clinic. Ophthalmol. 35, 945-949, 1981.

Visual sensitivity thresholds were measured in the fovea and in the perifoveal region 10° inferior to the fovea in 50 aphakic eyes of various ages ranging from 15 to 83 years. The corrected visual acuity of the test subjects was 0.9 or more. The sensitivity measurements were made by projecting monochromatic light with wavelengths of 467 and 551 nm into the screen of Tübinger perimeter. In the foveal region, there was no significant correlation between the sensitivity threshold and age. In the perifoveal region, a significant correlation ($p < 0.05$) was detected between the sensitivity threshold and age, particularly for the shorter wavelength. This observation suggested that the sensitivity of the perifoveal blue cone system might decrease with the advance in age. The density of the macular pigment averaged 0.258 log at 467 nm wavelength. No age-related change was detected in the density of macular pigment except individual variations. - Yasuo Ohta.

Correlazione statistica tra senso cromatico, età e sesso, by F. TOMEI and G. BORRAZZO (Clinica Oculistica dell' Università di Pisa), Atti Fond. G. Ronchi 37, 71-84, 1982.

The authors have examined at the Nagel anomaloscope 102 subjects (49 females and 53 males) aged from 11 to 75 years. From the results obtained they have worked out statistically the linear and non linear correlations between colour vision, age and sex. - The Authors.

Ocular examination in childhood, by J.J. DE LAEY and A. NEETENS (editors), Bull. Soc. Belge Ophtalmol. 202, 1982.

I wrote the chapters concerning the assessment of visual field, dark adaptation and colour vision in children. Reprints of these chapters are available. - Guy Verriest.

A survey and evaluation of lantern tests of color vision, by B.L. COLE and A.J. VINGRYS (Department of Optometry, University of Melbourne, Victoria, Australia), Am. J. Optom. Physiol. Opt. 59, 346-374, 1982.

This paper reports a survey of the lantern tests that have been or are used to evaluate the color vision of people who wish to enter occupations that require the ability to recognize colored signal lights reliably. The origin

of each lantern is traced and the principal features of each are described. The available data concerning fallure rate of normals, the failure rate of people with defective color vision, and the extent to which scores on lantern tests correlate with field trials are summarized. Despite the fact that lantern tests have been used since the turn of the century and that some lanterns have been in use for more than 30 years and some for much longer periods, the available validation data are incomplete and sometimes conflicting. However, the data do indicate that some lanterns may fail a significant proportion of normals and that there is considerable variation between lanterns in the proportion of color vision defectives that will fail. It is noted that most lanterns will pass some protanomals despite their reduced sensitivity to red light and correspondingly short visual range for red signals. The view of Cameron is supported that a more rational approach would be to make a clinical diagnosis of the type of color vision defect, to reject protanopes, deuteranopes, and protanomals and to use a lantern test only to determine which deuteranomals should be accepted. - The Authors.

Trial tritanomaloscope for detecting tritan subjects and results on fundus diseases, by Y. IZUTSU (Dept. of Ophthalmol., Tokyo Med. College, Tokyo, Japan) Folia Ophthalmol. Jpn. 32, 2334-2343, 1981.

It is well known that fundus diseases affect blue-yellow color discrimination. A trial tritanomaloscope for detecting tritan defects was developed by using interference filters. We selected 50 normal male and 50 normal female subjects, aged 10-60, as well as a number of subjects with central serous chorio-retinopathy, uveitis (Vogt-Koyanagi-Harada disease), pigmentary retinal dystrophy, macular degeneration, and retrobulbar neuritis. We examined each of the subjects with the F-M 100 hue test, Panel D-15, $F_2$ test, H-R-R Plates, Nagel anomaloscope type I and the trial tritanomaloscope. The clinical results of the trial tritanomaloscope were compared with the results of other tests. Results : (1) The match point was narrow in normal subjects but moved to the blue side in older subjects; (2) Even in cases where the results of Panel D-15, $F_2$ test and H-R-R plates were normal, the match was enlarged; (3) The results of the trial tritanomaloscope were quite compatible with that of the F-M 100 hue test; (4) Blue sensibility remained abnormal during a long time. - Yasuo Ohta.

Clinical application of visually evoked cortical potential using color stimuli, by A. SHIRAKAWA (Dept. of Ophthalmol., Jikei Medical College, Japan), Jap. J. Clinic. Ophthalmol. 35, 1001-1007, 1981.

Visually evoked cortical potential (VECP) was recorded by stimulating the fovea with 440, 540 or 610 nm monochroma-

tic light for either 10 or 200 msec. In 4 normal eyes (2 subjects), light stimulus stronger by 1.25 log unit over the threshold value was necessary to induce the appearance of $P_1$ wave for 440 nm. For wavelengths of 540 and 610 nm, stimulus stronger by 0.5 to 0.75 log unit over the threshold value sufficed to induced $P_1$. This finding indicated that a different mechanism is involved in the production of VECP for the shorter and longer wavelength light stimuli. The observed difference according to the wavelength was more apparent in 2 eyes with retrobulbar neuritis, particularly when the stimulus lasted for 200 msec. It appears that the present method promises to be of value in detecting impairment in the visual conduction system in the presence of optic nerve disorders. - Yasuo Ohta.

Visual pigment kinetics in abnormalities of the uvea-retinal epithelium interface in man, by M. ALPERN and H. KRANTZ (5044 Kresge II, University of Michigan, Ann Arbor, Michigan 48109, USA), Invest. Ophthalmol. 20, 183-203, 1981.

In four patients with abnormalities of the interface between photoreceptors and their vascular supply, bleached visual pigments regenerated abnormally slowly, with double exponential time courses, although the time constant of the first exponential was abnormally fast. During therapy in one patient the slower exponential returned to normal early after treatment, whereas the fast component persisted even after clinically complete recovery. The results could be explained by the following hypothesis. In normal eyes, two pigment-regeneration routes exist, the more rapid (which depends on a short-lived intermediate) playing no role after a long full bleach. Uvea abnormalities cause slower regeneration in the normal main route and slower breakdown of the normally short-lived intermediate. - The Authors.

Retinal dystrophies. A functional classification, by A. PINCKERS (Dept. of Ophthalmol., Univ. of Nijmegen, The Netherlands), Folia ophthalmol. (Leipzig) 7, 105-111, 1982.

The present paper is an illustration and a guide for a functional classification based on the anatomy of the retina. The classification enables a follow-up study of diseases and their transition from stage to stage without being forced to put a diagnosis in first instance that must be corrected afterwards. There is an essential difference between hereditary-stationary defects (protanopia, achromatopsia) and hereditary-progressive defects (Stargardt, retinitis pigmentosa). In a functional classification these two forms can be sufficiently separated if we use the term dysfunction for hereditary-stationary defects and the term dystrophy for hereditary-progressive defects. - The Author.

Early-stage abnormality of foveal pi mechanisms in a patient with retinitis pigmentosa, by Rockefeller S.L. YOUNG (University of Illinois Eye and Ear infirmary, 1855 West Taylor Street, Chicago, Ill. 60612, USA), J. Opt. Soc. Am. 72, 1021-1025, 1982.

The patient of this study is a protanope who is afflicted with retinitis pigmentosa. As with other patients studied, an abnormality in Stiles's pi-1 mechanisms was found in the patient's worse eye (20/35 visual acuity). From his rejection of monochromatic color matches, we inferred that the sensitivity of the short-wave cones is reduced, but their signals are not abnormally attenuated by the middle-wave cones. The patient's pi-4 thresholds, however, were within the range of normal control values. - The Author.

Sensitivity losses in a long wavelength sensitive mechanism of patients with retinitis pigmentosa, by Rockefeller S.L. YOUNG and A. FISHMAN (University of Illinois Eye and Ear Infirmary, 1855 W. Taylor St., Chicago, Il 60612, USA), Vision Res. 22, 163-172, 1982.

The foveal vision of certain patients afflicted with retinitis pigmentosa may be mediated solely by a long wavelength sensitivity (lws) mechanism, because (1) increment threshold data could always be fitted to a single template curve with unity slope, (2) test and field sensitivities differ only by proportionality constant over the visible spectrum, (3) intense background fields have additive (quantum catch) effects on thresholds, and (4) wavelength differences of bipartite foveal stimuli could not be distinguished. Both test and field sensitivities were appreciably lower than the lws sensitivity values for unaffected deuteranopes. The action spectrum was similar (but not identical) to estimates of the erythrolabe absorption spectrum. The results provide a better understanding of the photopic vision of patients with retinitis pigmentosa and further evidence that their effective optical density of residual cones is reduced. - The Authors.

The color vision defects of pigmentary retinal dystrophy, Relation to visual acuity and visual field disturbance, by O. OKAJIMA, T. TANINO and M. OKAMOTO (Dept. of Ophthalmol., School of Med. Univ. of Tokyo, Japan), Acta Soc. Ophthalmol. Jpn. 85, 435-440, 1981.

The color vision of 72 patients (115 eyes) with pigmentary retinal dystrophy of autosomal recessive inherence was studied using Farnsworth's Panel D-15. To know the progressive nature of color vision defects with evolution of this disease, color vision was compared with visual acuity and visual field disturbance.

The extent of color vision defects closely paralleled loss of visual acuity and change of visual field measured with Goldmann's perimeter using the 1/4 target. Even in cases with normal visual acuity, type III acquired blue-

yellow defect was found in 11 out of 49 eyes and in the group with visual acuity between 0.6 and 0.4, it was found in 14 out of 27 eyes. In the group with visual acuity of 0.3 or less, no eye with normal color vision was found. And in the group with visual acuity of 0.1 or less, total achromatopsia was found in 7 out of 11 eyes. Of all eyes, type III acquired blue-yellow defect was found in 39 per cent and total achromatopsia was found in 17 per cent. So, color vision, like visual acuity and visual field, can be an index of evolution of pigmentary retinal dystrophy. - Yasuo Ohta.

Colour anomia restricted to the left visual hemifield after splenial disconnexion, by J. ZIHL and D. von CRAMON (Max-Planck-Institute for Psychiatry, Munich, GFR), J. of Neurology, Neurosurgery, and Psychiatry 43, 719-724, 1980.

In a patient with damage to the right occipital lobe and to the splenium of the corpus callosum, an incomplete colour anopia in the left upper quadrants and a colour anomia was found for the complete left visual hemifield beyond 2° eccentricity. The patient had no difficulty in recognising coloured targets when presented in the periphery of the left visual half-field and in the foveal region, but could not name them correctly. The results suggest that the lesion of the splenium of the corpus callosum disconnects the right visual cortex from the language areas of the left hemisphere, and the specific disturbance of colour naming is the consequence. - The Authors.

Statokinetic dissociation in lesions of the anterior visual pathways, A reappraisal of the Riddoch phenomenon, by A.B. SAFRAN and S. GLASER (Bascom Palmer Eye Institute, Dept. of Ophthalmol., Univ. Miami School of Med. PO Box 016880, Miami Flor. 33101, USA), Arch. Ophthalmol. 98, 291-295, 1980.

With standard Goldmann perimetry, physiologic dissociation of kinetic and static stimuli was first investigated in 15 normal subjects. Variable degrees of statokinetic dissociation (SKD) occurred for white and for red (achromatic perception) targets, but not for chromatic recognition of red. To analyze relative sensitivity of these stimuli in defining field defects, a set of "isopter equivalents", eg, white I2e, red I4c (achromatic perception), and red V4e (chromatic recognition) was empirically established in normal and in pathologic fields of 11 patients with compression of the anterior visual pathways. The "Riddoch phenomenon" (SKD) was documented in defective fields in all patients with tumors; SKD occurred for white or for red achromatic perception. The most sensitive technique for elaborating field defects proved to be static presentation of white or red stimuli (achromatic perception) and chromatic recognition of

static or kinetic red. As a rapid, sensitive screening method, especially for subtle defects, we suggest the addition of chromatic recognition of kinetic red stimuli to the application of standard kinetic white stimuli. Our findings are discussed in light of current concepts of retinal ganglion cell physiology. - The Authors.

Further study about colour discrimination from the ergo-ophthalmological stand point, by R. PAOLETTI PERINI (Ospedale S. Maria Nuova, USL 10/A, Firenze, Italy), Atti Fond. G. Ronchi 37, 97-99, 1982.

The present paper is a report about a recent screening of colour discrimination from the ergo-ophthalmological stand point using the Ishihara plates, the Farnsworth tritan plate $F_2$ and the City University Colour Vision Test. The response to Ishihara has been recorded monocularly and a certain influence of training is noticed. The practical validity of the Farnsworth tritan plate and of the distinction between "typical" and "not typical" errors with the Ishihara plates in order to the diagnosis of colorimetrical anomaly are also tackled. - The Author.

PAPER READ AT THE 18TH MEETING OF THE EUR. ASSOC. FOR THE STUDY OF DIABETES (Budapest, 1982)

Diabetic and colour sense deficiencies : their importance in self-management and visual prognosis, by P. DE PALMA, F. TOMASI, L. RAVALLI, A.M. GRALDI, M.C. NATALI and G. SAMORI (Department of Diabetes and Metabolic Diseases and Eye Clinic, St. Anna Hospital, Ferrara, Italy).

A mass screening of 593 diabetic patients was carried out in order to point out possible congenital or acquired colour sense deficiencies. The number of errors made by color blind patients in reading glycosuria and acetonuria test papers (Diastix, Glukur-test, Ketostix) using prepared glucose and acetone solutions at known concentrations was evaluated. Of the colour blind diabetic patients thus tested, 61% made at least one error; the errors were most numerous in patients affected by congenital red-green dyschromatopsia. The test paper which caused the greatest number of errors (approximately 60%) was Diastix. Thus the authors feel it necessary to evaluate the colour discrimination capacity of patients before instructing them in glycosuria and acetonuria determination. It is also necessary to establish which test paper type the patient can read correctly. In relation to manifest tritan dyschromatopsia, the authors are conducting further research aimed at verifying whether such colour sense deficiencies could be early symptoms of diabetic retinopathy.

PAPER READ FOR THE EUROPEAN SOCIETY OF HUMAN GENETICS

(Madrid, 1982)

Sex-linked achromatopsia and the colour vision cluster, by L.N. WENT.

On the basis of extensive experience with autosomal dominant tritan (blue) colour vision defects in 51 individuals from 6 families, the combination of these with X-chromosomal deutan and protan defects could be studied. In males with deuteranomaly or protanomaly and a tritan defect a simple addition of abnormalities with colour vision testing is observed, while one man with protanopia and a tritan defect cannot distinguish any colours but has a normal visual acuity.

In a family with sex-linked achromatopsia and very much decreased visual acuity (around 0.1) in affected males, the presence of an additional gene for deuteranomaly has led to the hypothesis that this achromatopsia is due to the simultaneous presence on one X-chromosome of the non-allelic genes for deuteranopia and protanopia. An additional requirement for this hypothesis, which will be argumented, is that the protan and deutan genes are very close to each other, possibly comparable to the Rhesus gene complex.

PAPERS READ AT THE INT. PERIMETRIC SOCIETY SYMPOSIUM

(Sacramento, 1982)

Loss of inhibitory mechanisms as a measure of cone impairment : A method applied in static colour perimetry, by E. HANSEN and T. SEIM.

Delayed recovery of light sensitivity following exposure to bright light is characteristically found in normal eyes due to inhibitory influences between retinal receptor mechanisms. The rods, when acting alone, have a great capability of fast recovery as demonstrated by rod monochromats. In those patients as well as in progressive cone dystrophies, static perimetry performed immediately after extinction of a yellow adapting light demonstrates a particularly high rod sensitivity. On the other hand, normal individuals demonstrate clearly elevated thresholds (transient tritanopia). The ability to recover after light exposure, as demonstrated by this type of static perimetry, is an indirect but significant indication of cone function.

Ophthalmoscopic perimetry, by J.T. ERNEST and J.S. READ. We have constructed and tested a computer assisted television ophthalmoscope for the examination of the visual field. The instrument is capable of both kinetic and static perimetry with direct visualization of test target position on the ocular fundus. The ocular fundus is viewed using modified Zeiss optics and a low-light-level television camera. The

viewing (background) light source is a 500 watt tungsten lamp furnishing either white or green (560 nm interference filter with a half band width of 10 nm) resulting in a retinal illuminance approximately equal to that from a Goldmann perimeter when the patient has an 8 mm pupil. The target is the end of a fiber optic placed in a plane conjugate with the retina. Its light source is a 150 watt heat filtered Xenon arc lamp furnishing either white light or light of different colors. The colored targets are obtained with near-monochromatic light at 14 different wavelengths between 460 and 700 nm. The target light intensity can be rapidly varied under computer control in 0.03 log unit increments with a neutral density wedge. The target size is approximately 150 microns on the retina (about 0.5 degree, or 9 mm at 1 meter). With each 1 second target presentation the images are scanned and digitized and when the patient indicates that the target has been seen the digitized image is stored. The visual fields are analyzed using semi-automatic programs under the control of the operator. The images (100-200) are aligned using an interactive image comparison program. The operator identifies both a vascular landmark and the target in each image and the computer generates either density or meridian plots superimposed on the image of the ocular fundus. Ophthalmoscopic perimetry eliminates fixation problems and makes possible precise retinal localization of defects in the visual system.

'Extrafoveal Stiles' pi-mechanisms, by K. KITAHARA, R. TAMAKI, J. NOJI, A. KANDATSU and H. MATSUZAKI.

The threshold versus intensity (t.v.i.) curves and field sensitivity action spectra for short and medium wavelength sensitive cone mechanisms and rod mechanism were measured from the central fovea to 10 degrees extrafoveally using a Maxwellian view optical system. Differences among the t.i.v. curves and field sensitivity action spectra for each mechanism at foveal and extrafoveal locations will be described.

## PROVISORY SCIENTIFIC PROGRAMME
## OF THE 7TH INT. IRGCVD SYMPOSIUM

Geneva 23th-25th june 1983

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WEDNESDAY 22th JUNE

15.00 Closed meeting of the IRGCVD Committee on Standardization

17.00 Closed meeting of the IRGCVD Directorial Committee

TUESDAY 23th JUNE

8.00 Greeting by Prof. A. ROTH

8.05 Announcements by Dr. G. VERNIEST

SPECIAL THEME : ELECTROPHYSIOLOGY AND COLOUR VISION
Chairman : E. ZRENNER

8.10 F.M. de MONASTERIO (Bethesda, USA) : Electrophysiology and colour vision. I. Cellular level (Invited paper)
8.40 Discussion
8.50 E. ZRENNER (Bad Nauheim, GFR) : Electrophysiology and colour vision. II. ERG and EVP (Invited paper)
9.20 Discussion
9.30 G.H. JACOBS & J. NEITZ (Santa Barbara, USA) : ERG indices of color vision variations in monkeys.
9.45 M.L.F. de MATTIELLO & A. BIONDINI (Buenos-Aires, Argentina) : Correlates between chromatic electrophysiological recordings and chromatic psychophysical functions in normal and abnormal observers.
10.00 Coffee break
S 10.30 Y. GRALL, Y. BOITEUX, J.F. LEGARGASSON and J. KELLER (Paris, France) : Evoked visual potentials and structured coloured stimulations.
S 10.45 Y. UJI & M. YOKOYAMA (Tsu-City, Japan) : The spectral response pattern recorded with scanning method of ERG in congenital colour defectives.

SESSION ON METHODS OF EXAMINATION
Chairman : C.R. CAVONIUS

S 11.00 H. ICHIKAWA, K. HUKAMI & Sh. TANABE (Nagoya, Japan) : New pseudoisochromatic plates for acquired color vision defects.
11.15 O. LAGERLOF (Stockholm, Sweden) : Pseudo-isochromatic charts in acquired dyschromatopsia.
S 11.25 I.E. GAYL & J.S. WERNER (Boulder, USA) : A comparison of methods for assessing the effectiveness of color vision screening tests and an evaluation of the Pflüger trident plates.
11.40 J. BIRCH & L. HAMON (London, UK) : Comments on the use of the Standard Pseudoisochromatic Plates and the New Color Test of Lanthony.
S 11.55 K.J. BOWMAN, M.J. COLLINS and C.J. HENRY (Brisbane, Australia) : The effect of age on performance on the Panel D-15 and Desaturated D-15, A quantitative evaluation.
S a 12.10 P. LANTHONY (Paris, France) : Assessment of normal range of the 40-hue scores.
S 12.20 M.J. BLOCK, J.P. FITZSIMONS, B.S. KALEY, W.G. McLAUGHLIN & M. TRAYNOR (Glasgow, Scotland) : A new approach to the scoring and evaluation of the Farnsworth-Munsell 100-hue test.

S 12.30 K. KITAHARA (Tokyo, Japan) : An analysis of the Farnsworth-Munsell 100 hue test

12.45 Lunch

14.00 R. FLETCHER (London, UK) : A revised three light test.

S 14.10 A. SERRA, L. RONCHI and M. SIOTTO PINTOR (Cagliari/ Florence, Italy) : On the comparison of monocular and binocular 100-hue responses.

14.25 J. KAMMANN & C.R. CAVONIUS (Dortmund, GFR) : Clinical evaluation of the OSCAR color deficiency screening test.

14.35 G. VERRIEST & A. UVIJLS (Ghent, Belgium) : Value of the Rodenstock Farbentestscheibe 3040.173 for the diagnosis of congenital colour vision defects.

14.45 A. GONELLA & M.L.F. de MATTIELLO (Buenos-Aires, Argentina) : Validity of different contrast tests.

15.00 M.L.F. de MATTIELLO & A. BIONDINI (Buenos-Aires, Argentina) : Saturation contrasts : Clinical application potential.

15.15 H. ZWICK, T. GARCIA & D.L. LUND (San Francisco, USA) : Solid state spectral dark adaptometry.

15.30 J.J. MEYER, L. ZOGANAS, D. HERMES & A. ROTH (Geneva, Switzerland) : Psychophysical flicker thresholds in congenital and acquired colour vision deficiencies.

S 15.45 J. PERALES & E. HITA (Granada, Spain) : Influence of some factors on no typical responses to three tests of color vision in children.

16.00 Coffee break

SESSION ON CONGENITAL COLOUR VISION DEFECTS
Chairman : J. MOLLON

S 16.20 R. KLIEGL, J.S. WERNER & V.J. VOLBRECHT (Berlin, BRD/Boulder, USA) : Computed shifts in dichromatic neutral points associated with variation in prereceptoral screening pigments.

16.35 W. JAEGER & H. KRASTEL (Heidelberg, GFR) : Trichromatic and anomalous trichromatic colour vision examined with small and large field matches by means of the projection anomaloscope.

16.50 S.J. DAIN & B. DUFFIELD (Kensington, Australia) : Spatial summation in dichromats.

17.05 J. MOLLON, A. BIRD, J. BOWMAKER, & H.J.A. DARTNALL (Cambridge, UK) : Psychophysical and microspectrophotometric measurements for the same deuteranopic observer.

S 17.20 P. SCHEUFENS & H. SCHEIBNER (Düsseldorf, GFR) : Mesopic deuteranopic vision with a large field.

S 17.35 L.N. WENT & N. PRONK (Leiden, The Netherlands) : Achromatopsia and combination defects of protan, deutan or tritan genes.

17.50 End

FRIDAY 24TH JUNE

SPECIAL THEME : METAMERIC MATCHES RELEVANT FOR ASSESSMENT OF COLOUR VISION
Chairman : M. MARRE

8.30 J. POKORNY (Chicago, USA) : Metameric matches relevant for assessment of colour vision. I. Fundamental aspects (Invited paper)
9.00 A. ROTH (Geneva, Switzerland) : Metameric matches relevant for assessment of colour vision. II. Practical aspects (Invited paper).
9.30 Discussion
9.45 M. MARRE (Dresden, G.D.R.) : Rayleigh-equation in acquired color vision defects.
10.00 Coffee break
S 10.30 L.R. RONCHI, R. PACLETTI-PERINI, S. FERENCZI & J. MAKAI (Florence, Italy/Budapest, Hungary) : Brightness-luminance discrepancy in the frame of colour vision deficiencies.
10.45 J.D. MORELAND (Bradford, UK) : Analysis of variance in anomaloscope matches.
11.00 A. ROTH, D. HERMES & D. FUMEAUX (Geneva, Switzerland) : Clinical colorimetric examinations in the purple.
11.15 A.R. HILL (Oxford, UK) : Assessing defective colour vision with a metameric slide rule.

SESSION ON VARIOUS SUBJECTS
Chairman : G.H. JACOBS

11.30 A.B. SAFRAN (Geneva, Switzerland) : Switching to black and white.
11.45 J.L. VOLA, LAMOUREUX & P. GASTAUD (Marseilles, France) : The Mac Collough effect (poster).
S 11.55 C. MAGIS (Paris, France) : Unknown geometrical properties of the CIE chromaticity diagram.
12.10 F. VIENOT (Paris, France) : Egalisations de couleur sur grands champs : Modifications selon l'excentricité et la durée de présentation (poster).
12.20 J.D. MORELAND (Bradford, UK) : Retinal distribution of macular pigment.
12.30 Lunch

SPECIAL THEME : CLINICAL COLOUR VISION TEST BATTERIES
Chairman : W.D. WRIGHT

14.00 A. PINCKERS (Nijmegen, The Netherlands) : Clinical colour vision test batteries (Invited paper).
14.30 Discussion
14.40 A.R. HILL & P.A. ASPINALL (Oxford/Edinburgh, UK) : Principles of colour vision test battery selection.
S 14.55 M.T. BLOCK & B. CHAUHAN (Glasgow, Scotland) : An evaluation of a multi-item test (poster).

S 15.05 A. SERRA, C. MASCIA, C. DESSY, M. SICTTC PINTOR & R. CASTI (Cagliari, Italy) : Acquired defects of colour discrimination statistically evaluated through a battery of tests.

S 15.20 M.T. BLOCK (Glasgow, Scotland) : A procedure for aggregating scores from test batteries.

S 15.35 C.J. KRÜGER & H. HONEGGER (Hannover, GFR) : Do colour discrimination tests predict the results at the Nagel anomalosdope?

15.50 J. BIRCH (London, UK) : The contribution of the City University Test (1st & 2nd Editions) in a clinical test battery.

16.05 Coffee break

16.35 R.W. MASSOF (Baltimore, USA) : In memoriam Louise L. Sloan.

16.55 General meeting of the IRGCVD

17.30 End

SATURDAY 25TH JUNE

SESSION ON ACQUIRED COLOUR VISION DEFECTS
Chairman : A. ROTH

8.30 M. MARRE & E. MARRE (Dresden, GDR) : The three colour vision mechanisms in different field sizes in acquired color vision defects.

S 8.45 T. MIYAMOTO, Y. OHTA, E. TANABE, T. MOTOHASHI & K. SHIMIZU (Tokyo, Japan) : Saturation discrimination of acquired colour vision deficiencies on the tritanopic confusion line.

S 9.00 E. WOLF & G. KLUXEN (Düsseldorf, GFR) : Colour vision in a case of unilateral nuclear cataract (poster).

9.10 J.L. VOLA, LAMOUREUX & P. GASTAUD (Marseilles, France) : Color vision in cataractous eyes before and after surgical treatment (poster).

S 9.20 L. BARCA, A. DE LUCA & F. PASSANI (Florence, Italy) : Results of the 100-hue test after successful surgical treatment of retinal detachment.

9.35 J.L. VOLA, C. POLI, P. GASTAUD & J. LEID (Marseilles, France) : Drüsen and color vision.

S 9.45 K.J. BOWMAN & K.D. CAMERON (Brisbane, Australia) : A quantitative assessment of colour discrimination in normal vision and senile macular degeneration using some colour confusion tests.

10.00 Coffee break

S 10.30 D. TRUSIEWICZ, A. KORDALEWSKA & K. ZEBROWSKA (Warsaw, Poland) : Colour vision in relation to other visual functions in the presence of slight of macular degeneration (poster).

10.40 M. MAIONE, L. SCOCCIANTI, M.G. TOMBA & L. ARSENIO (Parma, Italy) : On the regression between 100 hue test score and age in preretinopathy diabetes.

10.55 R. HARRAD (London, UK): Some results of analysis of the 100 hue test in a group of diabetic patients.

11.10 M. MAIONE, L. SCOCCIANTI, G. BONTEMPELLI, M.G. TARDINI, S. CARONNA, R. CARNEVALI, D. BERARDI & A. STRATA (Parma, Italy) : On the 100 hue test performance as a risk factor for diabetic retinopathy.

12.25 J. BRONTE-STEWART (Glasgow, Scotland) : Colour vision testing in diabetic children.

S 11.35 G.H. BRESNICK & J. CRAWFORD (Madison, USA) : Color-dependent urine glucose testing by diabetic patients.

11.50 T. STEINSCHNEIDER & U. TICHO (Jerusalem, Israel) : Correlation between colour vision deficiency and results of clinical examination in glaucomatous patients.

12.05 E. WOLF and U. WEBER (Düsseldorf, GFR) : Hemeralopia with a tritan colour vision defect.

S 12.20 K. ICHIKAWA, H. ICHIKAWA and M. HOSHINO (Nagoya, Japan) : Clinical application of transient tritanopia effect.

12.35 H. ZWICK & K. BLOOM (San Francisco, USA) : Rhesus contrast sensitivity and acuity associated with foveal alteration (poster).

12.50 Lunch

14.00 End.

ISCEV
International Society for Clinical Electrophysiology of Vision

## APPLICATION BLANK

The International Society for Clinical Electrophysiology of Vision (ISCEV) tries to promote scientific work on subjects such as clinical electroretinography (ERG), electro-oculography (EOG) and visually evoked potentials (VECPs). It encourages co-operation and communication between workers in the field of clinical and basic electrophysiology of vision.

Those wishing to become a member of the ISCEV are encouraged to fill in the application blank and return it to the ISCEV Secretary General, Dr. D. VAN NORREN. The membership fee is 120,-- Deutsche Mark (DM) or 50.- US which includes the proceedings of the annual symposium. Members receive the ISCEV Newsletter, which is issued once or twice a year, and they are entitled to a reduced conference fee. The next meeting will be held in Budapest from May 29 to June 3, 1983. The fee should be paid to the treasurers

PD Dr. E. ZRENNER
Max-Planck-Institute
for physiological and
clinical research
Parkstr. 1
D-6350 Bad Nauheim
West-Germany

Dresdner Bank
ISCEV-Bank account
Ludwigstr. 1
D-6350 Bad Nauheim
West-Germany
acc. No. 1 332 946 00

For those residing in socialist countries the membership fee is 50,-- Mark. This fee does not include the proceedings and should be transferred to the treasurer for socialist countries :

Prof. Dr. W. MÜLLER
Medizinische Akademie
Nordhäuser Strasse 74
DDR-50 Erfurt
German Democratic Republic.

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Application blank ISCEV. Forward to the Secretary-general :
Dr. D. van Norren, Kampweg 5, NL-3769 DE Soesterberg,
The Netherlands
Membership (please encircle) : Regular / Institutional/
Socialist country

Last name : .....

First name (and/or initials) : .....

Adress : .....

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Date :
Signature :