DALTONIANA

NEWSLETTER
OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

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EDITORIAL

Till an official decision will be taken in this respect, the provisory general secretary (Dr. G. Verriest) will act as editor of these Newsletters. He hopes that these will be in fact the product of the collaboration of all members of the Research Group.

Each newsletter should include some of the following sections :

1) Litterature Survey. Ideally this should cover all litterature from 1st january 1971 relating to all aspects of all deficiencies of colour vision (complete bibliographic reference with the eventual translation of the title in english, very short analysis in english, name of the reviewer). Already 25 members accepted to review some journals; other were contacted and are urgently requested to reply to the special circular. A complete list of the contributors will appear in a following issue of the Newsletter.

2) Lists of publications of members of the Research Group. Therefore each member (also each committee member!) is asked to send to the editor a complete list of all his (old and new) papers and books concerning (wholly or partly) the deficiencies of colour vision (the complete bibliographic reference but no comment). The capital R could indicate the papers of which reprints are still available. One or several of such lists will be printed in each newsletter.

3) Preprints of the summaries of papers of members of the Research Group waiting publication (no more than a half typewritten page for each paper, no drawings); description of works in progress on colour vision.

4) Lists of funds open to applications for research grants and stipends;announcements of facilities and centers willing to accept trainees in advanced methods; offers for joint research projects.

5) Correspondance, questions and answers, necrology, announcements of meetings, communications of the committee etc.

The publication will be irregular, depending on the available matters.

LITTERATURE SURVEY

Flicker heterochromatic threshold-reduction factor with two or more flickering fields, by M. IKEDA (Minolta Camera Res. Lab., Daisen-Nishimachi, Sakai, Japan), J. Opt. Soc. Amer. 61, 261-266, 1971.

In the original "flicker heterochromatic threshold-reduction factor" test for color vision introduced by Ikeda and Urakubo (J. Opt. Soc. Amer. 58, 27, 1968) the subject observes a flickering test field of alternating red and green lights of different luminances. He adjusts the ratio of the luminances to obtain minimum flicker. Since some subjects have difficulty determining minimum flicker, a modification was introduced by providing two such fields side by side. The task is either to indicate which field flickers more, in which the matching position is then determined by the method of constant stimuli, or to match the appearance of the fields by adjusting the luminances. Two normals obtained different results on different adaptation conditions, to green, red, or darkness, whereas those of a deuteranomal coincided on all three conditions of adaptation. The data of the normals seemed not to be frequency-dependent. A further modification was the presentation of 13 fields lined up horizontally, each field with a different ratio of luminances of red and green. Contrary to the normals, the field of minimal flicker indicated by the deuteranomal was the same for all 3 conditions of adaptation. - Ingeborg Schmidt.

Further studies supporting the identity of congenital tritanopia and hereditary dominant optic atrophy, by A. E. KRILL, V. C. SMITH and J. POKORNY (Eye Res. Lab., Univ. of Chicago), Invest. Ophthal. 10, 457-465, 1971.

The results of studies on 14 patients from 3 families with hereditary dominant atrophy (HDOA) described in a previous report (Krill, Smith and Pokorny, J. Opt. Soc. Amer. 60, 1132, 1970) demonstrate how this condition may be confused with, or even be, what other workers are calling congenital tritanopia. The almost identical color-vision profiles and the pattern of inheritance of HDOA and congenital tritan defects lead the authors to question the existence of congenital tritan defect as an independent entity. Some additional spectral tests were carried out on 3 patients : the wavelength discrimination data and the color mixture data agreed almost precisely with data obtained by other authors on subjects with tritanopia. Saturation discrimination was abnormal in the blue region from 400 nm to 460 nm. The luminosity curves were within normal limits. The authors emphasize that utmost care should be taken to rule out HDOA in future subjects in whom congenital tritanopia is suspected. First, it is necessary to show that both distance and near vision are normal. Second, visual fields must be normal. Third, not only the affected individual, but other members of the family should have normal-appearing optic nerve heads as well as normal visual acuity. And finally, the opthalmoscopic examination should be done by an expert because the changes (optic pallor) can be quite subtle. - Ingeborg Schmidt.

Color vision : An approach through the cone pigments, by W.A.H. RUSHTON (Institute of Molecular Biophysics, Florida State Univ., Tallahassee, Fla.), Invest. Ophthalm. 10, 311-322, 1971.

After a review of the history of the color vision theory from Young to Helmholtz, R. states that Young's resonators may be identified with cone pigments and that "The time has come to review the facts of color matching in terms of cone pigments instead of fundamental sensations." The protanope lacks one cone pigment-erythrolabe. His pigment is very insensitive in the red part of the spectrum. The deuteranope lacks the pigment chlorolabe, yet his pigment is not at all insensitive in the green part of the spectrum. This explains, for example, the asymmetry in a curve plotted against wavelength in bleaching experiments on deutans. Both psychophysics and densitometry support the view that these visual pigments are the two cone pigments in normal eyes in the red-green range, and that the spectral sensitivities of protanopes and deuteranopes, expressed in log quantum energy, coincide with the spectral sensitivities of two of Young's resonators. There is strong evidence for a third cone pigment, cyanolabe. Single cones contain single pigments. Quantum catches that result from exposure to a color may be plotted in a "cone pigment triangle." In this triangle, the deuteranopes confusion lines converge into the G corner, those of protanopes and tritanopes likewise on R and B. The pigment triangle displays complete symmetry in the confusions made by the three kind of dichromats. The triangle demonstrates also that no color exists in which chlorolabe is almost the only pigment excited. Color appearance depends upon the quantum catch in the cones and upon the processing of the resulting nerve signals. - Ingeborg Schmidt.

An appreciation of the proposed mechanisms involved in the physiology of colour perception, by R.J. ROBINSON (Queensland Institute of Technology), Australian J. Optom. 54, 256-275, 1971.

A review essay by an undergraduate. - D.P. Smith.

Contribution à l'étude du syndrome chiasmatique survenant au cours de la grossesse (Contribution to the chiasmatic syndrome occuring during pregnancy), by G. BONAMOUR, M. BONNET, N. LAFFAY (Dept. of Ophthal., Univ. Lyon, France), Ann. Oculist. (Paris) 204/3, 235-256, 1971.

In one subject suffering from the chiasmatic syndrome (bitemporal upper quadrant-hemianopsia with exclusion of the blind spot; visual acuity diminished) the central colour vision revealed to be normal. - A. Pinckers.

Deux cas d'encéphalopathie de Gayet-Wernicke avec mydriase unilatérale isolée (Two cases suffering from Wernicke's encephalopathy with isolated unilateral mydriasis), by P. CASTAIGNE, D. LAPLANE, H. SARAUX, P. AUGUSTIN (Dept. of Neurology, Hosp. Pitié-Salpètrière, Paris 13e, France), Ann. Oculist. (Paris) 204/3, 279-283, 1971.

Two cases of Wernicke's encephalopathy due to chronic alcoholism are described. In one case, visual acuity 9/10, colour vision (Farnsworth) was normal. In the second case colour vision of the left eye (visual acuity 3/10, temporal pallor of nerve head) was disturbed; two weeks after parenteral administration of vit. B1 colour vision (Ishihara, Farnsworth) became normal. - A. Pinckers.

La rétinopathie pigmentaire en secteur de G.B. Bietti (Bietti's sector shaped retinitis pigmentosa), by C. BISANTIS (Dept. of Ophth., Univ. Roma, Italy), Ann. Oculist. (Paris) 204/9, 907-954, 1971.

75 subjects suffering from sector shaped pigmentosa of Bietti (Bietti : Boll. Ocul. 16, 1159, 1937) are reviewed; 8 personal cases are added. In 36 subjects results of colour vision examination are available : 1 deutan type, 1 congenital achromatopsia, 2 achromatopsia, 7 blue-yellow, 24 normal; in one personal observation the right eye had normal colour vision, the left eye showing an achromatopsia. The 8 personal observations are illustrated by a 100 Hue graph or a 28 Hue graph (Roth).
The author concludes his investigation by stating that an advanced age of onset and also a satisfactory electroretinographic examination are the two fundamental parametres allowing a favorable prognosis. - A. Pinckers.

Etude clinique des troubles du sens chromatique pendant la maturation de la cataracte et après l'extraction du cristallin (A clinical study of colour sense disturbances during the opacification of the cristalline lense and after cataract extraction) by D. KARANTINOS (Dept. of Ophthal., Univ. Athens, Greece), Arch. Ophtal (Paris) 31/3, 235-244, 1971.

168 subjects suffering from various types of cataract were examined by means of colour vision tests (Ishihara, AO HRR, 100 Hue). 46 subjects are followed during the maturation of their cataract; the 100 Hue is the most reliable test, mostly yielding a blue-green disturbance. The colour vision disturbance starts as soon as opacification is visible and becomes more evident during maturation of the cataract. In the first days after extraction of the cataract the colour sense is disturbed but 6 months after the extraction most of the cases had normal colour vision. - A. Pinckers.

Toxicité oculaire de l'éthambutol (Ocular toxic effects of ethambutol), by Ph. VERIN, D. PESME, M. YACOUBI, S. MORAX (Dept. of Ophthal., Univ. Bordeaux, France), Arch. Ophtal. (Paris) 31/10, 669-686, 1971.

If medication with ethambutol is necessary, the purified dextrorotary derivate at doses varying between 15 and 25 mg/kg is recommended. The incidence of a reversible toxic optic neuritis is about 0,9%; there is an acquired red-green dyschromatopsia. The authors advise a complete ophthalmologic check-up, including colour vision examination, at the beginning of treatment and every three months. - A. Pinckers.

Les complications oculaires de l'hypoparathyroïdie familiale chez l'enfant (Ocular complications of familial hypoparathyreosis in children), by L. DRALANDS, Ph. EVRARD, P. PONCHON, J. ROMMEL and B. STANESCU (Dept. of Ophthal., Univ. Louvain, Belgium), Bull. Soc. belge Ophtal. 157, 374-392, 1971.

Two brothers with familial hypoparathyreosis had lens opacities, ptosis, alterations of ocular motility, retina, visual field, electroretinogram, dark adaptation and colour vision (tests : Ishihara, AO HRR, Panel D15 and anomaloscope). - L. Conreur.

Color defective vision and the recognition of aviation color signal light flashes, by M.F. LEWIS and J.A. STEEN, (Federal Aviation Administration, Civil Aeromedical Institute, Oklahoma City), Report No FAA-AM-71-27, 7 p., 1971.

Subjects of varying type and degree of color deficiency were tested on a battery of color tests, including the American Optical-H-R-R plates, the Dvorine plates, the Color Threshold Tester, the Farnsworth Lantern, the Farnsworth-Munsell 100-hue, the Farnsworth Panel D-15, the Titmus Vision Tester Color plate, and an anomaloscope examination. Correlations with a practical test of the ability of subjects to discriminate aviation signal red, white, and green were obtained. The results generally indicated that the Farnsworth Lantern was a superior predictor of performance on the practical test. - Authors.

Color defective vision and day and night recognition of aviation color signal light flashes, by J.A. STEEN and M.F. LEWIS (Federal Aviation Administration, Civil Aeromedical Institute, Oklahoma City), Report No. FAA-AM-71-32, 11 p., 1971.

In a previous study, we reported the efficiency with which various tests of color defective vision predict performance during daylight conditions on a practical test of ability to discriminate aviation signal red, white, and green. In the current study, subgroups of the subjects used in the previous investigation were tested with the signal light gun at night. Comparisons of the efficiency of each of seven tests of color defective vision in predicting performance under day and night conditions are reported. In general, the commercial tests were less efficient in predicting performance at night than in the daytime. This reduction in efficiency may be attributed to an increase in the false alarm rate of each test. - Authors.

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

1. Papers of Prof. Alex E. Krill, M.D. (Eye Research Laboratories of the University of Chicago, 950 East 59th Street, Chicago Ill. 60637, U.S.A.).

KRILL, A.E., and BEUTLER, E. - The red light absolute threshold in heterozygote protan carriers. Possible genetic implications, Invest. Ophthal. 2, 107, 1964.

R KRILL, A.E. - A technique for evaluating photopic and scotopic flicker function with one-light intensity, Doc. Ophth. 18, 452, 1964.

R KRILL, A.E., and SCHNEIDERMAN, A. - A hue discrimination defect in so-called normal carriers of color vision defects, Invest. Ophthal. 3, 455, 1964.

R KRILL, A.E. - Total color blindness and albinism in children; two causes of subnormal visual acuity, Post. Grad. Med. 37, 279, 1965.

KRILL, A.E., and SCHNEIDERMAN, A. - Retinal function studies, including the electroretinogram, in an atypical monochromat, Clinical Electroretinography, Supplement to Vis. Res., N.Y. Oxford Press, 1966.

KRILL, A.E. and BEUTLER, E. - Red-light thresholds in heterozygote carriers of protanopia : Genetic implications, Science, 149, 186, 1965.

R KRILL, A.E., BOWMAN, J.E. and SCHNEIDERMAN, A. - An investigation of a reported X-linked abnormality in color vision detected by the Ishihara plates, Ann. Hum. Genet., Lond., 29, 253, 1966.

KRILL, A.E. - Congenital color vision defects in Congenital Anomalies of the Eye, Trans. of the New Orleans Acad. of Ophth. St. Louis, C.V. Mosby Co., 1968, Chapt. 16.

R KRILL A.E. - The ERG in congenital color vision defects : in François, J., editor : The Clinical Value of Electroretinography, ISCERG Symposium, Basel, 1968, S. Karger, A.G., pp. 205-214.

R KRILL, A.E. - X-chromosomal-linked diseases affecting the eye; status of the heterozygote female, Trans. Amer. Ophth. Soc. 67, 535, 1969.

R KRILL, A.E., SMITH, V.C. and POKORNY, J. - Similarities between congenital tritan defects and dominant optic nerve atrophy : Coincidence or indentity? Journ. Opt. Soc. Amer., 60, 1132, 1970.

R KRILL, A.E. and FISHMAN, G.A. - Acquired color vision defects, Trans. Amer. Acad. Ophth. and Otol. 75, 1095, 1971.

R KRILL, A.E., SMITH, V.C. and POKORNY, J. - Further studies supporting the identity of congenital tritanopia and hereditary dominant optic atrophy, Invest. Ophthal., 10, 457, 1971.

2. Papers of Dr. H. Scheibner (W.G. Kerckhoff-Institut der Max-Planck-Gesellschaft, Parkstrasse 1, D.635 Bad Nauheim, DBR).

SCHEIBNER H. and RINALDUCCI E.J. - Novel tests of color vision in suspected dichromats, J. Opt. Soc. Amer. 55, 609, 1965.

BOYNTON R.M., SCHEIBNER H., YATES T. and RINALDUCCI E. - Theory and experiments concerning the heterochromatic threshold-reduction factor (HTRF), J. Opt. Soc. Amer. 55, 1672-1685, 196

SCHEIBNER H. and BOYNTON R.M. - On the perception of red by "red-blind" observers, Acta Chromatica 1, 205-220, 1967.

SCHEIBNER H. - Trichromasie, Dichromasie, Monochromasie, Optica Acta, 15, 329-338, 1968.

SCHEIBNER H. - Klasseneinteilungen von Farbreizen als Ordnungsprinzip von Farbsinnstörungen, Ber. Dtsch. Ophthal. Ges. 68, 281-286, 1968.

BOYNTON R.M. and SCHEIBNER H. - Residual red-green discrimination in dichromats, J. Opt. Soc. Amer., 58, 1151-1158, 1968.

SCHEIBNER H. - A lattice-theoretical classification of normal and defective colour vision. ACI Symposium COLOR 69, Stockholm 1969, Vol. I, S. 67-73. Musterschmidt, Göttingen 1970.

INGLING C.R., SCHEIBNER H. and BOYNTON R.M. - Color naming of small foveal fields, Vision Res., 10, 501-511, 1970.

SCHEIBNER H., KELLERMANN H.F. and BOLL M. - Untersuchungen zur Protanopie und Protanomalie, Ber. Dtsch. Ophthal. Ges. 71, 1971 (in press).

3. Papers of Prof. H. Kalmus (The Galton Laboratory, University College, Wolfson House, 4, Stephenson Way, London N.W. 1 England).

KALMUS H. - The familial distribution of congenital tritanopia with some remarks on some similar conditions, Ann. Hum. Gen. 20, 39-56, 1955.

KALMUS H. - The different worlds in which we live, Biology and Human Affairs, 22, 17-23, 1956.

KALMUS H. - P.T.C. thresholds, colour vision and blood factors of Brazilian Indians, I Kaingangs, Ann. Hum. Gen., 22, 16-21, 1957.

KALMUS H. - P.T.C. Thresholds, colour vision and blood factors of Brazilian Indians, II Carajas, Ann. Hum. Gen., 22, 22-25, 1957.

KALMUS H. - Defective colour vision, P.T.C. tasting and drepanocy tosis in samples from fifteen Brazilian populations, Ann. Hum. Gen., 21, 313-317, 1957.

KALMUS H. - Genetical variation and sense perception, CIBA Symp. on Biochemistry of Human Genetics, 60-72, 1959.

KALMUS H., AMIR A., LEVINE O., BARAK E. and GOLDSCHMIDT E. - The frequency of inherited defects of colour vision in some Israeli populations, Ann. Hum. Gen., 25, 51-55, 1961.

KALMUS H. - Distance and sequence of the loci for protan and deutan effects and for glucose-6-phosphate dehydrogenase deficiency, Nature, 194, 4824, 215, 1962.

KALMUS H. - Sense perception and behaviour, Symp. Wenner-Gren Found. for Antropol. Res., 27, 1-33, 1964.

KALMUS H., DE GARAY A.L., RODARTE U. and LOURDES COBO - The frequency of PTC-testing, hard ear wax, colour blindness and other genetical characters in urban and rural Mexican populations, Hum. Biol., 36, 134-145, 1964.

KALMUS H. - Diagnosis and Genetics of Defective Colour Vision, Pergamon Press, 114 pp, 1965.

KALMUS H. - Observations with Ishihara charts at low colour temperature, low light intensity and limited exposure time, Vis. Res., 11, 21-24, 1971.

4. Papers of Prof. Francesco Ponte (Via Libertà 103, Palermo Italy).

R PONTE R. and ARNONE G. - L'acromatopsia congenita. Suoi rapporti con le eredo-degenerazioni maculari, Giorn. Ital. Oftal., 17, 1, 1964.

R PONTE F. and SCIALFA A. - Associazione intrafamiliare di acromatopsia congenita completa e incompleta con ambliopia e atipica (senza ambliopia) a transmissione autosomale dominante, Ann. Ottal e Clin. Ocul., 14, 608, 1968.

R WIRTH A. and PONTE F. - Fisiopatologia e Clinica dell'Elettro retinogramma, Relazione al 47° Congresso Nazionale della Società Oftalmologica Italiana, Palermo, 1963, Edit. Industria Grafica Nazionale, Palermo, 1964.

PREPRINTS OF SUMMARIES OF PAPERS WAITING PUBLICATION

A. PINCKERS : Combined Panel D-15 and 100 Hue recording. (accepted for publication in Ophthalmologica)

If one buys a Farnsworth-Munsell 100 Hue test one gets the component of a Farnsworth Panel D-15 test. It is possible to plot the Panel D-15 results on a 100 Hue score sheet.

A. PINCKERS : La maladie de Stargardt (ERG, EOG et sens chromatique) (accepted for publication in Ann. Oculist.).

In 32 patients the diagnosis of Stargardt's disease was based upon the fundus picture. Visual acuity does not correlate with age or results of other function tests. Colour vision is frequently disturbed; combined with the electroretinographic findings this indicates a lesion at the level of receptors in the macula area. If there is also a diminished amplitude of the a-wave then the colour disturbance becomes more evident. A DT axis of the 100 Hue graph agrees with a strong displacement of the anomaloscopic setting towards the red end of the spectrum. The functional disturbances in cases of Stargardt's disease combined with the clinical picture of the fundus flavimaculatus do not differ from the findings in Stargardt's disease without the picture of the fundus flavimaculatus.

CORRESPONDANCE

For a certain research project I need a type II Nagel anomaloscope, in which the wavelengths of Red, Green and Yellow can be changed by a "main screw". These instruments are no longer manufactured. I own an excellent, new, Type I Nagel anomaloscope (1968), which is of no use for that project, since wave lengths are fixed. I am willing to exchange instruments, possibly on a temporary basis (for at least one year) and cover all expenses. Please write to Dr. A. Adam, Chaim Sheba Medical Center, Tel-Hashomer, Israel.

NECROLOGY

Clarence Henry Graham (6 January 1906 - 25 July 1971)

Graham received his doctorate in psychology at Clark University in 1930. His first academic position was at Temple University from 1930 to 1931. In 1931 he received an NRC fellowship for work at the Johnson Foundation at the University of Rennsylvania. During his year there, he collaborated in significant research with H. Keffer Hartline and Ragnar Granit on the physiology of vision. He moved to Brown University in 1936, and to Columbia in 1945 upon the retirement of R.S. Woodworth. For a brief period before

Selig Hecht's untimely death in 1948, Graham and Hecht collaborated in a Seminar en Vision.

In addition to the more than 100 research publications by Graham, there is excellent access to his work through his chapter in Murchison's Handbook of Experimental Psychology, his chapter on visual perception in Steven's Handbook of Experimental Psychology, and his chapters in Vision and Visual Perception.

(From J. opt. Soc. Amer.)

INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

Membership fee 1971/72. a) The members belonging to non socialist countries and who did not pay hitherto their membership fee are asked to send a draft or money order of 5 U.S. dollars (in U.S. currency!) to

Account N° 1023-415,
Bank of Montreal,
Administration Building Branch,
University of British Columbia,
1-764 VANCOUVER 8, B.C.
Canada.

or they can simply write out a cheque of 5 U.S. dollars on the name of the general treasurer

Professor R. LAKOWSKI
Department of Psychology
University of British Columbia
VANCOUVER 8, B.C.,
Canada.

Please send checks or correspondance relating to membership fee to Prof. Lakowski and not to Dr. Verriest!

b) The members belonging to socialist countries will be advised by Dr. M. Marré how to pay their fee.

Proceedings of the "International Symposium on Acquired Colour Vision Deficiencies" (Ghent, june 1971)

All correspondance concerning the subscription to these proceedings, the ordering of reprints etc. must be sent to

Mr. SCHÜLER,
S. KARGER AG,
Arnold Böcklinstrasse, 25,
CH-400 BASEL 11
Switzerland.

The next Symposium of our Group will be held in Scotland in the last days of June 1973. It will be devoted to recent advances in congenital and acquired deficiencies of colour vision.

Correspondance relating to this Symposium, to the Newsletters and to the standardization committee can be addressed to Dr. G. Verriest.