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NEWSLETTER
OF THE INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

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LITERATURE SURVEY

Comparison of four methods of heterochromatic photometry, by G. WAGNER and R.M. BOYNTON (Fernseh, Darmstadt and Center for Visual Science, Univ. of Rochester, Rochester, N.Y. 14627), J. Opt. Soc. Amer. 62/12, 1508-1515, 1972.

The four methods of heterochromatic photometry are : 1) direct comparison with white 2) step-by-step 3) flicker photometry and 4) minimally distinct border (MDB)-one of two juxtaposed fields is adjusted in radiance until the boundary appears to be minimally distinct. The MDB method yields results that are linear and obey Abney's additivity law. The flicker and MDB methods generate data that agree well with each other and also with the CIE standard observed (see also P.K. Kaiser, J. Opt. Soc. Amer. 61, 966, 1971). The data obtained by the two methods of direct comparison agree fairly well with each other, whereby they differ greatly from the data obtained by the flicker or the MDB methods. The variability of settings with the equal-brightness methods is significantly greater than with the MDB method (see also R.M. Boynton and P.K. Kaiser, Science 161, 366, 1968). Luminous efficiency as measured by the direct comparison methods seems to receive a contribution from two sources : a) achromatic signals of the photopic visual system which exclusively determine the MDB setting and b) chromatic signals of the visual system which produce extra brightness, the amount of which is related to the saturation of the stimulus used. The MBD method is well adapted to obtain an index of saturation in order to prove this theory.- Ingeborg Schmidt.

Flicker photometry with chromatic adaptation and defective color vision, by M. IKEDA, K. HUKAMI and MURAKUBO (Osaka, Japan), Amer. J. Ophthal. 73, 270-278, 1972.

When flicker photometry was used to measure the relative luminances of red and green stimuli, protanopes, protanomals, and carriers of a protan defect all showed luminosity losses at long wavelengths in comparison with the luminosity matches of normal subjects. This test did not differentiate deutans from normals.

When the flicker field was superimposed on a red adapting field, normal subjects showed a regular decrease in luminosity of the flickering red field relative to green, with increase in luminosity of the adapting field. Both protan and deutan subjects differed from the normal group in that they showed no selective chromatic adaptation, i.e. no change in red/green ratio with increase in luminance of the red adapting field. Carriers of a protan defect showed less chromatic adaptation than normal subjects. Too few deutan carriers were tested to permit definite conclusions. - Louise L. Sloan.

Glossary of the terms which are used in the study of the study of the deficiencies of colour vision (Glossario dei termini usati nello studio delle deficienze della visione dei colori), by G. VERRIEST, L. RONCHI et C. CASTELLINI (Istituto Nazionale di Ottica, Arcetri-Firenze), Atti Fond. G. Ronchi e Contr. Ist. naz. Ott. 28, 99-163, 1973.

This booklet of 69 pages gives definitions of most terms used by people concerned with colour blindness. The refer to the mechanisms and theories on normal colour vision, to the cones and their pigments, to the different kinds of congenital and acquired deficiencies of colour vision, to the photometric and colorimetric references, to the methods of examination, to the conditions in which the colour discrimination of the normal subjects is also weakened, and to some photometric and colorimetric basic facts. The principal functions are given quantitatively by 14 drawings and 5 tables. It is hoped that this small reference work will be useful to the younger students in the field. - Guy Verriest.

Reflections, old and new, concerning acquired defects of color vision, by A. LINKS (New York Medical College, N.Y.) Survey of Ophthal. 17/4, 229-240, 1973.

The differences between congenital and acquired color vision defects (the latter preferably called "secondary defects") tools helpful in detecting and classifying the disturbances and attempts at classifying acquired defects of color vision are reviewed. Seeming exceptions to Köllner's rule are commented. Of special interest is the discussion of the macular diseases affecting color vision. The author believes that color vision defects of the inherited macular forms are somewhat inaccurately termed acquired defects. - Ingeborg Schmidt.

On acquired color deficiencies, by Ingeborg SCHMIDT (Division of Optometry, Indiana University, Bloomington, Ind.), Optometric Weekly 64/2, 34-38, 1973.

The main characteristics of acquired color deficiencies, the differentiation between congenital and acquired forms and the essential methods of examination are briefly reviewed. A simplified classification is presented. A discussion on the validity of Köllner's rule and on the existence of congenital tritan defects concludes the review. The importance of adequate knowledge of acquired color deficiencies for the practicing optometrist is emphasized. - The Author.

Colour vision, by E.B. RABKIN (USSR), Encyclopaedia of occupational Health and Safety, Vol. I, A-K, pp. 322-323, Mc Grawhill Book Co., New York, St. Louis, San Francisco, 1971.

A very short and very general article. - Ingeborg Schmidt.

Illumination box for colour vision tests, by L. FRISEN and A. HEDIN (Dept. of Ophthalmology, University of Göteborg, Sweden), Acta Ophthal. (Kbh.) 50/4, 520-524, 1972.

Various light sources for colour vision testing are shortly discussed. An illumination box for pigment-based colour vision tests is described. A high colour temperature fluorescent tube is used as the light source. The box meets the requirements as to angles of light incidence and viewing and an adequate and uniform illumination on a neutral background is provided. - Anders Hedin.

Prolonged uninterrupted testing with the Nagel anomaloscope, by C. CASTELLINI and G. SALVI (Inst. Naz. Ott., Arcetri, Firenze) Luce e Immagini, 27, N. 2 (1973).

Ten normal and experienced individuals are tested and re-tested several times, in succession, throughout 40 min. lasting uninterrupted sessions, by means of a modified version of the Nagel anomaloscope (Rayleigh equation). The luminances of the red and green beams are varied in very small steps, by means of wedges the constant of which is 0.08 l.u./cm. The anomaly ratio Q is found to decrease slowly throughout the sessions. The rate of decay depends on the individual examinee. - Lucia Rositani-Ronchi.

The influence of age on performance in the Panel D-15 colour vision test, by J. HELVE and U. KRAUSE (University Eye Clinic, Oulu, Finland), Acta Ophthal. (Kbh.) 50/6, 896-900, 1972.

220 elderly people were examined with the Farnsworth Panel D-15 and the results were related to the findings of a routine ophthalmological examination. 11 subjects could not manage the test, mostly owing to low visual acuity. 193 subjects passed the test. Of these, 31 had macular degeneration, 4 cataract and 20 glaucoma. Among the 16 subjects failing the test, one was protan and one deutan. Eight persons showed a

tritan defect : five had macular degeneration, one glaucoma and one senile coloration of the lens. Six subjects failed with a confused pattern : three had macular degeneration, one had cataract and two were normal apart from brownish coloration of the lens. - Anders Hedin.

Color vision deficiencies in children, United States, by J. SCANLON and J. ROBERTS (Division of Health Examination Statistics). Data from the National Health Survey. Series 11, No. 118. US Dept. HEW Publication No. (HSM) 73-1600. Nat. Center for Health Statistics, Rockville Md., August 1972.

The report shows national estimates based on health examination survey findings from a probability sample (7119 color deficient) representative of children 6-11 years of age in the noninstitutional population of the United States. The children were screened by the Ishihara test and classified by the HRR plates. About 3.80% of the children were color deficient, 6.88% of the boys red-green deficient and about 0.53% blue-yellow deficient, 0,53% of the girls red-green deficient and about 0.18% blue-yellow deficient. White boys had a significantly higher prevalence of red-green deficiencies (7.36%) than did black boys (4.04%). No statistically significant regional differences in the prevalence of red-green deficiencies were observed among boys. Most blue-yellow deficiencies were of the mild type and almost all were tritan type defects. About 0.32% of the children had color vision deficiencies involving both red-green and blue-yellow perception. - Ingeborg Schmidt.

Studies on colour vision defects in alcoholics, by Y. SAKUMA (Dept. Ophthal., Tokyo Women's Medical College), Folia ophthal. jap. 22, 438-450, 1971.

Colour vision tests (Ishihara's plates, Farnsworth Panel D-15, modified Farnsworth-Munsell 100-Hue Test and Hioki's anomaloscope) were performed unilaterally on 56 eyes of 28 males with chronic alcoholism and 58 eyes of 30 males with alcoholic psychosis aged between 26 and 61 years.

Patients suffering from acquired colour vision defects, regardless the severity, usually do not read abnormally the plates of Ishihara. The cases accepting at the anomaloscope the normal Rayleigh equation but with an absolute Rayleigh equation range of more than 2 divisions were diagnosed as having an acquired red-green deficiency. The same diagnosis was made when the total error score was more than 80 at the 100-Hue Test. These standards for the anomaloscope and for the 100-Hue Test may be considered as equivalent.

80% of these patients suffering from chronic alcoholism and alcoholic psychosis have such an acquired deficiency of colour vision. It is considered that their anomalous colour vision is principally an acquired red-green deficiency due to a lesion of the visual pathway. It is presumed that colour vision is more disturbed than visual acuity in these alcoholic patients.

On the basis of the total errors score at the 100-Hue Test, no cases were aggravated by treatment, and the improvement of visual acuity and colour vision were proportional. The X-linked genetic theory about the relationship between alcoholism and congenital red-green deficiency is denied. - Yasuo Ohta.

Colour vision defects in alcoholism, by J.W. SMITH G.S. BRINTON, Quarterly Journal for Studies on Alcohol 32(1-A), 41-44, 1971.

Studies whether the high incidence of defects in colour vision in alcoholics might indicate a genetic predisposition to alcoholism and cirrhosis. 172 male and 33 female alcoholics were tested at the beginning of their treatment with Ishihara plates for colour vision. Subjects who showed defects on their test were retested at the end of the treatment period. 65 male and 13 female subjects were initially scored as defective in red-green colour vision. On retesting them after treatment, 17 male and 5 female subjects showed deficiencies. The number of subjects showing significant defects on retesting indicates that the rate of red-green colour defectiveness in alcoholics is essentially the same as that in the general population. Vitamin depletion, common in alcoholics, seems a likely explanation for the temporary colour vision defects. - Romuald Lakowski.

Exploration fonctionnelle des névrites optiques alcoolo-tabagiques (Functional exploration of optic neuritis due to alcohol and excessive smoking), by G.E. JAYLE, P. METGE, A. CHAIX, J.L. VOLA, &A. TASSY, (Inst. J. Daviel, Hôtel-Dieu, Marseille), Arch. Ophtal. (Paris) 32/1 bis, 79-86, 1972.

Thirty two cases of optic neuritis due to alcohol and tobacco are examined. Colour vision was tested according to Verriest (Ishihara, Tritan-Plate, AO HRR, Panel D-15, F.M. 100-Hue, Anomaloscope Nagel Model I; illuminant : Macbeth Daylight Lamp). In only 4% of the eyes examined colour vision was normal; a deutan axis (red-green type II) was found in 77%. Although after 45 days of treatment colour vision improved only 17% returned to normal colour sense. - A. Pinckers.

Etude d'une chorio-pathie unilatérale atypique du pôle postérieur d'évolution serpigineuse centrifuge (Study of an atypical unilateral choroidopathy of the posterior pole with centrifugal serpiginous evolution), by G. VABRES (Ophth. Depart. Val de Grâce, Paris), Ann. Oculist. 205/8, 927-940, 1972.

Description of an unique case of an acquired unilateral choroidopathy, probably induced by a circulatory disturbance at the level of the lamina choriocapillaris. Colour vision examination (F.M. 100 Hue) revealed a tritan axis. - A. Pinckers.

Studies on colour vision defects in cerebral palsy, by Y. SAKUMA (Dept. Ophthal., Tokyo Women's Medical College), Folia ophthal. jap. 22, 105-116, 1971.

Colour vision tests (Ishihara's plates, Okuma's plates, Farnsworth Panel D-15, modified Farnsworth-Munsell 100-Hue Test and Hioki's anomaloscope) were performed on 53 patients consisting of 32 males and 21 females suffering from cerebral palsy and aged between 11 and 21 years.

Colour vision defects were found in 41 of the 53 cases, namely 21 cases of acquired red-green deficiency, 1 case of suspected blue-yellow deficiency and 19 cases of total color weakness, which presumably constituted a later stage of acquired red-green deficiency. No congenital colour deficiency has been found in these cases.

Thus abnormal colour vision in cerebral palsy is not congenital and is due to the lesion of the visual pathways. As to the colour vision defects, no significant differences were found between the athetotic and spastic types of cerebral palsy. - Yasuo Ohta.

Achromatopsie congénitale (Congenital achromatopsia), by A. PINCKERS, (Ophth. Department, Univ. Nijmegen, The Netherlands), Ann. Oculist. 205/7, 281-834, 1972.

Twenty six patients with presumed congenital achromatopsia were examined by ERG and colour vision tests (AO HRR 2nd ed., Ishihara 12th ed., Panel D-15, Stilling 16th ed., Nagel Anomaloscope Model II; illumination : 6 Philips T.L. tubes colour 57, providing 1750 lux). The ERG findings varied from a pure cone dysfunction to a mixed cone-rod dysfunction, indicating that the bioelectric picture is not uniform. Progression was found in one case. The distincion between complete and incomplete achromatopsia was difficult. - A. Pinckers.

Achromatism, an Unlooked-for hazard with urine self-testing in diabetes, by W.O.G. TAYLOR (Heathfield Hospital, Ayr, Scotland), Trans. Ophthal. Soc. U.K. 92, 95-97, 1972.

This paper describes a patient with an apparently congenital protanopia with a superadded blue-yellow dyschromatopsia caused by tapeto-retinal degeneration of both fundi (probably late onset developmental resulting in a cone dysfunction syndrome). In consequence of this he proved unable to control his diabetes with the "clinitest" and repeatedly was found out of control. There was no evidence of diabetic retinopathy by fundus examination or angiography. A substitute test, with which he is able to cope since the change is largely one of light absorption, proved satisfactory. - W.O.G. Taylor.

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

37. Papers by Dr. Ingeborg SCHMIDT. To be added to the list published in "Daltoniana" nr. 10, p. 12-14 :

SCHMIDT I. - The "Green Areas" of Mars and Color Vision, Xth Internat. Astronaut. Congress, London 1959 Proceed., 171-180, Springer, Vienna, 1960.

SCHMIDT I. - Comments on the X-Chrom lens, Journ. Amer. Optom. Assoc. 43, 199-201, 1972.

SCHMIDT I. and B. GRAMBERG-DANIELSEN. - Zum Grenzbereich zwischen normaler und anomaler Trichromasie, Klin. Mbl. Augenheilk. 160, 483-490, 1972.

SCHMIDT I. - On acquired color deficiencies, Optom. Weekly 64/2, 21-25, 1973.

38. Papers by Dr. L.L. SLOAN (Wilmer Institute, John Hopkins Hospital, Baltimore, Maryland 21205, U.S.A.)

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SLOAN L.L. - Improved Screening Test for Red-Green Color Deficiency Composed of Available Pseudo-isochromatic Plates, J. opt. Soc. Amer. 35, 761-766, 1945.

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R TAYLOR W.O.G. - "An Advisory Clinic for Colour Defective Children", Trans. Ophthal. Soc. U.K., 86, 591-605, 1966.

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40. Papers of Dr. G. VERRIEST (Dienst Oogheelkunde, Akademisch Ziekenhuis, De Pintelaan 135, B-9000 Gent, Belgium)

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INTERNATIONAL RESEARCH GROUP ON COLOUR VISION DEFICIENCIES

The directorial committee, the standardization committee and the general assembly of the International Research Group on Colour Vision Deficiencies met during the Edinburgh Symposium in june 1973.

Prof. J. FRANCOIS, president, announced to the general assembly that the directorial committee, which following the statutes had to stay for two years and had to be composed of 12 members, was actually composed of only 10 ones. It was proposed to add Prof. WALRAVEN (Holland). From the other hand, as Mrs. SLOAN (U.S.A.) and Prof. WRIGHT (U.K.) wanted to retire from this committee, it was proposed to replace them respectively by Prof. SPERLING (U.S.A.) and Dr. RUDDOCK (U.K.). The general assembly agreed. The actual composition of the directorial committee is thus : FRANCOIS (president), VERRIEST (general secretary and editor of the Newsletter), LAKOWSKI (general treasurer and special secretary for the western hemisphere), M. MARRE (special secretary and treasurer for the socialist countries), DUBOIS-POULSEN, JAEGER, LE GRAND, CHTA, RUDDOCK, SPERLING, WALRAVEN (members).

For what concerns the place of the following symposium, to be held in june 1975, Prof. FRANCOIS announced that the directorial committee received invitations from Vancouver (Canada), Parma (Italy), Strasbourg (France) and Amsterdam (The Netherlands), but that Vancouver should be reserved for 1977 as the Association Internationale de la Couleur is meeting in the States at that time. The generall assembly's vote decided for Amsterdam. As a simultaneous translation is too expensive, the directorial committee decided that preprints should be sent in advance to the participants of the following symposia.

Because of the devaluation of the U.S dollar and the costs of the Newsletter, Prof. FRANCOIS suggested, on proposal of Prof. LAKOWSKI, general treasurer, that the annual membership fee should be augmented from 5 to 10 U.S. dollars (or the equivalent amount in the currencies of the socialist countries). The general assembly agreed.

The standardization committee that was set up at the Ghent meeting has not succeeded in Edinburgh to fully discuss and agree upon its terms of reference. This committee proposed therefore that Dr. VOS (The Netherlands) should be appointed as the coordinator of a study group that will decide what the terms of reference of such a standardization committee could be. The general assembly agreed.

Several propositions were made concerning the contents of "Daltoniana". They will be discussed in the editorial of a next issue.