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.)

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LITERATURE SURVEY

Processing of intensity and wavelength information by the visual system, by R.L. DE VALOIS (Primate Vision Labor., Psychol. Dept., Univ. of California, Berkeley, Calif.) Invest. Ophthal. 11, 417-487, 1972.

A review of experimental work on the visual system of primates which suggests that the color information and the luminance information are partially but not completely separated at the level of the lateral geniculate nucleus and are treated in two different ways in the cortex : in one "channel" color and brightness are separated, in the other they are combined and utilized indiscriminately for pattern recognition.- Ingeborg Schmidt.

Color opponency from fovea to striate cortex, by P. GOURAS (Section of Neurophysiology, Lab. of Vision Research, Nat. Eye Institute, US Dept. HEW, Bethesda, Md. 20014), Invest. Ophthal. 11, 427-434, 1972.

The work on rhesus monkeys indicates that the vast majority of ganglion cells subserving the fovea are color opponent cells, presumably midget ganglion cells. The paper considers how information about color and form are extracted from such color opponent cells. - Ingeborg Schmidt.

The interaction of color and luminance in stereoscopic vision, by C. LU and D.H. FENDER (California Inst. of Technology, Pasadena, Calif.), Invest. Ophthal. 11, 482-490, 1972.

The interaction of the luminance distribution and the color distribution of the two retinal images in the formation of a depth perception was explored with the use of Julesz type of patterns, in which depth cannot be inferred from monocular cues. The results indicate that color and relative luminance are used to identify objects, but luminance alone is used as the principal signal to determine their depth. - Ingeborg Schmidt.

Vision with chromatic filters, by S.M. LURIA (Naval Submarine Medical Center, Croton, Conn.), Amer. J. Optom. 49/10, 818-829, 1972.

The effectiveness of blue and yellow filters in improving visibility and resolution of blue and yellow targets against yellow, green and blue backgrounds is tested. The stimuli for the increment threshold study were circular spots variable in size and intensity, for the visual acuity study a transparent Landolt C of variable luminance illuminated from behind. Yellow filters improved visibility of yellow targets against blue backgrounds. Their effectiveness decreased as the wavelenght of the background increased, as the size of the target decreased, and with the age of the observer. The blue filters were generally ineffective. The results are explained mainly by a change in contrast brought about by the filters. The use fulness of yellow facemasks for drivers under certain conditions is discussed. - Ingeborg Schmidt.

Broad- vs. narrow-band filters at absolute threshold, by L. RONCHI and M. CETICA (Istituto Nazionale di Ottica, I-50125 Arcetri/Firenze, Italia), Atti Fond. G. Ronchi 28/1, 1973.

Let the absolute threshold be recorded by placing a filter of increasing optical density in front of the eye. If the light is passed through a broad band (say Wratten) filter, an increase of density is accompanied by a reduction of the passed band. In particular, in the range where vision is uncertain, the band passes from 40 or 60 nm to 10 or 20 nm. The attempt is made to estimate the "residual" wavelength by calculating the product $\tau\lambda\ E_\lambda\ V_\lambda$ (transmission factor by spectral emission by visibility factor). The calculated data are compared to the experimental data recorded by using a 6' test spot exploring the dark-adapted retina. Some unpredictable discrepancies are found. However, their entity is relatively small. The conclusion is drawn that the "residual" wavelength may be predicted in a first approximation by using the scotopic V_λ picked up from the literature.- Lucia Rositani-Ronchi.

Image as Appearance of Reality (Das Bild als Schein der Wirklichkeit), by H. SCHOBER and I. RENTSCHLER (Institut für medizinische Optik, München, D.B.R.), Reihe Welt der Bilder, Heinz Moos Verlag, Hartnagelstrasse 11, 8032 Gräfeling vor München, 1972.

This is very beautiful book showing most kinds of optical illusions, impossible objects etc. designed as well by scientists as by artists of the past and of today. This will remind to all some neglected visual phenomena. Many plates are in full colours and some of them relate directly to colour vision and even to its deficiencies. - Guy Verriest.

Color Blindness, An evolutionary approach, by R. CRUZ-COKE, American Lecture Series, Ch. C. Thomas, Springfield (Ill), 1970. gr. 8 , XVI, 156 p., 40 fig., 24 tables. 8,75 $

This book on color deficiency differs from other ones on the same topic mainly by its structure. In contrast to other communications which describe the different kinds of color deficiency and the methods to recognize them, the author tries to consider them, for the ophthalmologist's use, in context with our knowledge on color physiology and color metrics. What the author mainly wants to do (as indicated by the sub-title) is to show developments. That is why he considers e.g. explicitly genetics which are, there is no doubt, an important branch for the phenomenon of color deficiency (and vice versa, for the knowledge of congenital color deficiencies produced much material for genetics). The author concludes from the distribution of color deficiency that the caucasian race is particularly prone to it (as some other authors believe, too). Further considerations on acquired color deficiencies lead the author to the assumption that in historical ages alcoholism caused changements of the X-chromosome so that the rate of color deficiencies is increased. Whether or not one has to follow this opinion so far may remain to be seen; at least the author demonstrates that he did not intend to give a conventional presentation of the matter, but that he wants to discuss interesting own points of view; he finds himself supported by some publications of other authors in this respect. Therefore we have here an interesting book worth to be read (though some minor blemish may be mentioned, e.g. in the spelling of names of authors or of journal titles). - Manfred Richter.

Chromatic adaptation (Farbumstimmung), by Heinz TERSTIEGE (Bundesanstalt für Materialprüfung, Berlin, Fachgruppe 5.4 : Farbmetrik), Die Farbe 20, 276-288, 1971.

The mechanisms of chromatic adaptation enables man to recognize the specific color of dayly-life objects. The chromatic adaptation has been formulated quantitatively by von Kries in his coefficient law. But the result of a genuine von Kries-tranformation on the basis of this law depends on the choice of the basic physiological primaries. The results can also be predicted by the coefficientllaw only for retinal illuminances of less than 10 000 or 15 000 trolands; beyond this limit the persistance law breaks down. Non-linear formulations of the coefficient law seem to give sometimes a better correlation to the visual impression than the linear one. - The consideration of a transformation to take chromatic adaptation into account should enable better correlations to the experimental facts in the field of color rendering as well as in the assessment of color distances and metamerism. - The Author.

Deuteranopia : dichromatism by fusion or by absence? (Deuteranopie : Fusions- Oder Ausfall-Dichromasie?), by H.G. WAGNER (Darmstadt), Die Farbe 20, 317-323, 1971.

The investigation of deuteranopic vision and the findings of several authors are reviewed. The inconsistency of the results is explained by Willmer as being attributable to two different phenomena, either the missing of the green fundamental sensation or the green and the red fundamental sensations being fused. Willmer's ideas are outlined on the geometrical model of color space. The numerical values of the coefficients of fusion are determined both by calculation and graphically. Some conceiva le fusing mechanisms are dealt with. - The Author.

The CPC Test on Color Sense, by S. MINATO (Color Planning Center, Tokyo, Japan), Die Farbe 20, 289-298, 1971.

In the application of colors one has to consider that many factors are involved in the process of color perception. The CPC Test will examine the aptitude of a testee to solve tasks of color application. The test consists of eight particular tests : for normal color vision, color discrimination, color memory, color identification in the case of greater spatial distances, association capability to given color combinations, and for aesthetic assessment of color combinations. - The Author.

Validity of a preschool colour vision test, by B.J. COX, Journal of School Health, 41(3), 163-165, 1971.

A preschool colour vision test utilizing finger tracing was used as a screening device to detect children with defective colour vision. The phi-coefficient of efficiency indicates that the preschool test is somewhat better than classification of normals and defectives purely by chance. However, considerable uncertainty remains. - Romuald Lakowski.

The significance of the TMC and HRR color-vision tests as to red-green defectiveness, by J.J. VOS, W. VERKAIK and J. BOOGAARD (Institute for Perception RVO-TNO, Soesterberg, The Nederlands), Amer. J. Optom. 49/10, 847-859, 1972.

To get some insight into why the diagnosis by pseudo-isochromatic plates fails sometimes, a mathematical analysis was carried out on the HRR and the TMC tests. The study was restricted to the detection and scaling of red-green defectiveness. For the mathematical treatment the number of subjects had to be reduced : no similar scores were taken into account and the number of protan subjects was chosen equally to the number of deutan subjects (diagnosed with the anomaloscope). Considering the scores of the subjects, obtained by a special scoring method, as coordinates in a multidimensional linear space, the subjects can be placed in this space, thus forming a cloud of points. Factor analysis

tries to find the directions in this space, along which the variance of the points is maximal, second largest etc. The mathematical analysis leads to the conclusion that the TMC test has its handicap which cannot be overcome by an improved scoring technique. The HRR test is good, but the scoring is not optimal. An improved test called HRR-R (R for "reevaluated") with a new scoring form is proposed. It includes a choice of 17 HRR plates, and a category "week" is added for classification of the degree of color defectiveness. The superiority reached by the HRR-R is shown and also demonstrated that a great number of "unclassified" can be classified by using the TMC test in addition to the HRR-R test. - Ingeborg Schmidt.

Classification of dyschromat by degree using the anomaloscope with neutral density filters, by I. IINUMA (Department of Ophthalm., Wakayama Medical College) Jap. J. Ophth., 15/3, 163-170, 1971.

In an attempt to improve the differentiation of dichromats from anomalous trichromats by the Nagel anomaloscope the author suggests to test at 3 different luminance levels of the field : 1 (ordinary testing condition), 1/4 and 1/16, the latter two produced by inserting neutral density filters. The matching range of the Rayleigh equation serves as criterion. In 25 normals the range of matches extended slightly from a mean range of 1.62 $\pm$ 0.19 to 3.94 $\pm$ 0.36 at the dimmest field. Three cases showed no change. Of 70 dyschromats (protans and deutans) 65.7% showed a tendency towards narrowing of the matching range with decreased brightness, the more the dimmer the field. In 7 protanopes and 5 deuteranopes the range remained unchanged, 0 to 73. In 16 deuteranomals of different degrees the range remained the same, in 6 very mild deuteranomals (who had a small range of matches) the range showed a similar small expansion as in normals.

Experiments with drugs were carried out on 5 deutans : 3o min after instillation of one drop of 1% pilocarpine the range of the Rayleigh equations showed a tendency toward narrowing, even if the initial range was 0 to 73, and 30 min after instillation of one drop of mydrin (Mydriaticum Roche) the range showed a tendency toward extending. Aside of the effect on retinal illuminance the pos ibility of specific effects of the drugs on color vision via the autonomous nervous system is mentioned. The author hypothesises that with the dimming of the anomaloscope field some hue shifts occur causing the observed effects. A new classification of protans and deutans into 7 classes according to the ranges of matches on the three luminance levels is proposed. - Ingeborg Schmidt.

Evaluation of 100 Hue Test (Color Discrimination Test) (4) Comparison of the Scores of This Test with the Lantern Test, by K. HUKAMI and H. ICHIKAWA (Saiseikai Kyoto Hosp., Japan) Folia Ophthal. Jap. 22, 227-230, 1971.

In the previous papers the scores of the 100 hue test were shown as one index Qd=A+S/100. It was proved that this index Qd was very valuable in indicating relations of the results of this test with other color vision tests, anomaloscope, color vision test chart, or Panel D-15.

With the 100 hue test and the lantern test 252 deutans were tested among which 104 were deuteranopes and 148 were deuteranomals. The index Qd divided the color defectives into groups of equal members in each degree, $2 \leq Qd \leq 9$. But the lantern test divided them into groups of gradually increasing members upon errors, except 0 and 3.

Color defectives responded differently to the 100 hue test and the lantern test, because it was presumed that the latter employed color lights and the former employed pigment colors. - Yasuo Ohta.

Studies on the Illumination in the Color Vision Test using the Color Discrimination Tester, Report 1, On the Luminance, by S. SAI (Dept. Ophthal., Tokyo Medical College), Acta Soc. ophthal. jap. 75, 2211-2221, 1971.

With the diffusion of the color discrimination test, it is now necessary to provide the appropriated artificial illumination. Hence, the author has conducted an experiment in order to determine the optimum illuminating conditions of the test. The experiment was made on 11 subjects who had normal vision and color senses using a color discrimination tester (including achromatic color) manufactured by the Japan Colors, Co., Ltd. together with a H Company purely natural white fluorescent lamp as the light source. The illuminances applied for the experiment are 100 lx, 200 lx, 300 lx, 550 lx, 1000 lx, and 1500 lx. As the result, the following conclusion has been drawn from the experiment.

(1) The best results were obtained at 550 lx. Below 550 lx, the illuminance was insufficient, and above 550 lx the results obtained were poor as a glare was caused by the plastic plate mounted on the color chips.

(2) At each illuminance, confusion was most frequently observed at the red-yellow section and at the white section with a higher lightness. These differences can be attributed to some defects of the present color discrimination tester.

(3) Natural daylight is limited by weather, time, place and other factors. It is possible to perform the test even under the light of fluorescent lamp at any time by employing such an equipment as that used in this experiment.-Yasuo Ohta.

Chloroquine retinopathy : The peculiar behavior of the light sense, by R. STEIN, V. GODEL and P. NEMET, Klin. Mbl. Augenheilk. 161/2, 183-191, 1972.

The clinical symptomatology, the specific functional disorders and the fluorescein angiograms are described in 3 cases of advanced chloroquine retinopathy. Colour vision was

examined by pseudo-isochromatic plates (Ishihara) and Farnsworth Test. One case showed normal colour vision. In the second case the colour sense was disturbed (blue-yellow disturbance). The third case showed a "severe impairement" of colour vision (not described nor discussed). - Marion Marré.

Sectorial tapetoretinal degeneration, by T. IVANDIC, Klin. Mbl. Augenheilk. 160/1, 98-103, 1972.

The author reports on 3 patients who are not relatives and who showed a bilateral sectorial tapetoretinal degeneration. Two of them had an acquired blue-yellow disturbance and an abolished ERG. - Marion Marré.

Studies on Acquired Anomalous color Vision in Patients with Subacute Myelo-Optico-Neuropathy, by H. MATSUO, S. OKABE, H. UENO, M. TAKABATAKE and K. MAETA (Dept. Ophthal., Tokyo Medical College), Folia Ophthal. Jap. 22. 158-166, 1971.

1) Thirty-seven patients with an established diagnosis of SMON (Subacute Myelo-Optico-Neuropathy) were subjected to color discrimination test, consisting of F-M 100-hue test and dichotomous test Panel D-15.

2) Optic nerve atrophy was observed in 10 cases. In this group, all cases showed an acquired anomaly of color vision. Eight cases showed acquired dyschromatopsia with green-red axis, and blue-yellow axis was observed in 1 case. Another case was of a non-classified type.

3) Twenty-seven cases in 37 cases of SMON manifested no optic nerve atrophy. In this group, the results of color discrimination test were normal in 18 cases and other 9 cases showed acquired dyschromatopsia (3 cases of gre n-red axis, one case of blue-yellow axis type, 5 cases of non-classified type). - Yasuo Ohta.

Congenital achromatopsia generally given little attention as a cause of "bilateral amblyopia", by H. AICHMAIR and P. HEILIG (II. Univ. - Augenklinik Wien, Austria), Klin. Mbl. Augenheilk. 160/6, 714-716, 1972.

During the past few years 7 children with congenital achromatopsia were found in the out patient department for orthoptics and pleoptics. These were mostly referred with the diagnosis "bilateral amblyopia".

After discussing the results of examination the difficulties of differential diagnosis and the resulting consequences which the patients have to bear are given.

Contrarily to publications found in literature the results of the investigations show that congenital achromatopsia is not so rare. - Marion Marré.

Colour Vision Deficiency in third and sixth grade boys in association to academic achievement and descriptive behavioral patterns, by S.D. ESPINDA, Dissertation Abstracts International 32, (2-A), 786, 1971.

Concerned primarily with the investigation of colour vision deficiency in elementary school children and its possible association with diminished personal, social, and academic development. It was hypothesized that colour vision deficiency in children would cause difficulty with the early elementary school's heavily colour laden curriculum. These initial negative experiences would contribute to the development of inadequate emotional adjustment. These factors were thought to reflect in decreased academic performance, inadequate personal and social adjustment, a negative attitude in school, increased absenteeism and a preference for an effectively oriented teacher.

Study was limited to third and sixth grade boys, who were tested for colour vision with the Ishihara Pseudo-isochromatic Plates. Colour vision deficient students were paired with colour normal children until an N of 200 was obtained; 50 colour deficient and an equivalent comparative

group for each age level. Grade point averages were determined by the teachers' marks. Children were given the Preferred Instructor Characteristics Scale (PICS) and the Thinking About Yourself (TAY). Teachers filled out the Burks' Behavior Rating Scale for all students.

Colour deficient students were rated as having significantly greater behavior problems, although no significant differences were obtained in terms of the PICS and TAY instruments, academic grade point average, absenteeism and rank of attitude toward school. A significantly greater number of all children studied reported a preference for an affective classroom approach than for a cognitive one.

The data reflected a definite trend in all instances to lowered G.P.A. for colour deficient students. - Romuald Lakowski.

The usefulness of color blindness test plates in serial examinations, by E. SCHENKEL, Klin. Mbl. Augenheilk. 160/3, 361-368, 1972.

In the course of a basic research on the distribution and frequency of disturbances of color vision 23 114 turkish workers in Germany were examined. The test plates used were the author's own combination of Ishihara and Rabkin plates. Contrarily to up to data publications a lower percentage of 6.5 was found. - Marion Marré.

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

34. - Papers by Dr. L. RONCHI (Istituto Nazionale di Ottica, 6 Largo Fermi, Arcetri, Florence 50125, Italy).

R RONCHI L. - On the electrical responses of the human eye to red stimuli of different time distributions of luminance, J. Opt. Soc. Amer. 48, 437-438, 1958.

R RONCHI L. - A brief inquiry on color education, Actes des VII^mes Journées Internationales de la Colour, Fireze, 2-7 Mai 1963.

R RONCHI L. and BITTINI M. - On some peculiar effects occuring under green and blue stimulations, Actes des VII^mes Journées Internationales de la Couleur, Fireze, 2-7 Mai 1963.

R RONCHI L. and TITTARELLI R. - Detection of circular light signals in relation to shape and color identification-I-Preliminary report, Atti Fond. G. Ronchi, 20, 61-67, 1965.

R RONCHI L. and SALVI G. - The failure of additivity law as revealed by the fusion conditions of various red-blue mixtures, Atti Fond. G. Ronchi, 22, 69-76, 1967.

R RONCHI L. and SALVI G. - Flickering entoptical halo for various color mixtures, Atti Fond. G. Ronchi, 22, 690-695, 1967.

R RONCHI L. and NOVAKOVA O. - On the fine structure of the luminance time relationship for various wavelengths, Atti Fond. G. Ronchi, 27, 65-78, 1972.

R RONCHI L. and CETICA M. - On the variability of total visual scotopic transmittance for red and blue filters, Atti Fond. G. Ronchi, 27, 353-362, 1972.

R RONCHI L., NOVAKOVA O. and CETICA M. - Spectral sensitivity beyond the blind spot-I-Small size test flash, dark-adapted retina, Atti Fond. G. Ronchi, 27, 425-432, 1972.

R RONCHI L. - Sensitivity across the dark-adapted retina for stimuli of various durations and spectral compositions, Mod. Probl. Ophth. 11, 63-71, 1972.

35. Papers by Dr. Ingeborg SCHMIDT (Division of Optometry, Indiana University, 800 E Atwater Str., Bloomington, Indiana 47 401, U.S.A.).

SCHMIDT I. - Über manifeste Heterozygotie bei Konduktorinnen für Farbensinnstörungen, Klin. Mbl. Augenheilk. 92, 456-467, 1934.

SCHMIDT I. - Über "Ermüdbarkeit" des Farbensystems bei normalen Trichromaten Klin. Mbl. Augenheilk. 94, 433-442, 1935.

SCHMIDT I. and TRENDELENBURG W. - Untersuchungen über Vererbung von angeborener Farbenfehlsichtigkeit, Sitzungsber. Preuss. Akad. Wissensch. Phys.- math. Kl. 1935 II, 71 p., Berlin, 1935.

SCHMIDT I. - Ergebnis einer Massenuntersuchung des Farbensinns mit dem Anomaloskop, Zeitsch. für Bahnaerzte No. 2, 10 S., 1936.

SCHMIDT I. - Untersuchungen über die Verwendbarkeit der Ishiharatafeln zur Differentialdiagnose von Farbensinnstörungen, Klin. Mbl. Augenheilk. 96, 289-306, 1936.

SCHMIDT I. - Der gegenwärtige Stand unserer Kenntnisse von den Störungen des Farbensinns und die Farbensinnprüfung bei der Luftfahrt, Luftfahrtmedizin 1, 53-68, 1936.

SCHMIDT I. - Farbens innuntersuchungen an normalen und anomalen Trichromaten im Unterdruck, Luftfahrtmedizin 2, 55-71, 1937.

SCHMIDT I. - Physiologie, Pathologie und Theorien des Farbensehens. In : M. RICHTER, Grundriss der Farbenlehre der Gegenwart, Th. Steinkopff, Dresden und Leipzig, 1940, 61-95.

SCHMIDT I. and RUFF S. - Untersuchungen über die Erkennung der in der Fliegerei verwendeten farbigen Signallichter durch Farbenuntüchtige, Luftfahrtmedizin 5, 53-65, 1940.

SCHMIDT I. - Ein Signalfarbengerät zur Farbsehprüfung in der Luftfahrt, Der Deutsche Militärarzt, 6, 539-544, 1941.

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SCHMIDT I. - Über zwei Fälle von angeborener Blaugelbsehstörung, Klin. Mbl. Augenheilk. 109, 635-652, 1944.

SCHMIDT I. - Tagsehen (Farbensehen). Fiat Review of German Science 1939-1946, 227-255, 1948, Bd. 59, T. III.

SCHMIDT I. - Color Vision. In "German Aviation Medicine World War II." Vol. II, 910-918, 1950.

SCHMIDT I. - New Tests for the Examination and Training of Color vision : I. Pseudoisochromatic Plates. Rep. No 1, 11 p. July 1948, USAF SAM Randolph Field, Texas. No. 21-02-044.

SCHMIDT I. - id. Rep. No. 2, 7p. Sept. 1949, USAF SAM, Randolph Field, Texas. Proj. No. 21-02-044.

SCHMIDT I. - id. Rep. No. 3 Color Vision Multitester (Signal Lamp) for Aviation. 14 p. April 1952, USAF SAM, Randolph Field Texas. Proj. No. 21-29-006.

SCHMIDT I. - id. Rep. No 4, Evaluation of the Color Vision Multitester (Signal Lamp) for Aviation. 10 p. June 1954. USAF SAM, Randolph Field, Texas. Proj. No 21-29-006.

SCHMIDT I. and H.W. ROSE. - Physiological Effects of Reflective, Colored and Polarizing Ophthalmic Filters. Rep. No. 2. Effect of Ophthalmic Filters on Color Vision. Sept. 1949. USAF SAM, Randolph Field, Texas, Proj. No. 21-02-040.

SCHMIDT I. - Comparative Evaluation of the New London Navy Lantern for Testing Color Perception. 9 p. Proj. No. 21-29-009, August 1951, USAF SAM Randolph Field, Texas.

SCHMIDT I. - Effect of Illumination on Testing Color Vision with Pseudo-Isochromatic Plates, J. opt. Soc. Amer. 42, 951-955, 1952.

SCHMIDT I. - Comparative Evaluation of the Hardy-Rand-Rittler Polychromatic Plates for Testing Color Vision. Proj. No. 21-31-013, 10 p. June 1952, USAF SAM, Randolph Field, Texas.

SCHMIDT I. and FLECK H. - Rotator and Illuminator for Pseudo-isochromatic Plates, Arch. Ophthal. 48, 75-82, 1952.

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36. Papers of Professor Edgar Auerbach, Director, Vision Research Laboratory, Hadassah Hospital, Jerusalem Israel.

AUERBACH E. - Mechanisms of Colour Discrimination, Proc. of an Int'l. Symp. on the Fund. Mech. of the Chromatic Discrim. in Animals and Man, (ed. Y. Galifret) In Chapter : Visual Pigments of Colour Vision, Paris 1958, Pergamon Press (1960) pp. 177-182.

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AUERBACH E. - The Value of the Different Components for Clinical Electroretinography, In : The Clinical Value of Electroretinography (ed. François J.) ISCERG Symp., in Ghent, August 1966, S. Karger, A.G. Basel 1968, pp. 162-173.

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OFFICIAL COLOUR VISION REQUIREMENTS

GREAT BRITAIN (1972)

TRANSPORT.

Road	Private Car Goods Vehicles Heavy Goods Vehicle Public Service Vehicle	No colour restrictions.
Railways	Footplate Staff	Colour Vision "normal"
	Other Grades - grouped as	A1 - C.V. "normal" A2 - C.V. "normal" (but certain exceptions allowed)
		B, C) No requirement.

Classes A1 & A2 must be re-examined at age 45, and thereafter 5-yearly until age 60, then 2-yearly.

Footplate Staff reviewed at "regular intervals".

Colour vision test method not given, but believed to be by a lantern test.

AVIATION.

Civil	Air-line Transport Pilot Flight Navigator Flight Engineer Radio Officer Air Traffic Controller	Colour Perception "normal"
	Private Pilot	Colour Perception "normal"

Tested by P.S.C. Plates. Doubtful cases then tested by Giles-Archer or Martin Lantern. If still in doubt, referred to Medical Branch, Department of the Environment.

Air Force Three grades -
CP2 Ishihara, no errors under specified lighting conditions
CP3 Some errors on Ishihara, but passes Giles rcher or Martin Lantern test.
CP4 Fails Ishihara and Lantern Test ('Colour Unsafe')

Tests normally conducted by R.A.F. Ophthalmic Department.

Air-crew must achieve CP2 or CP3. CP4 is acceptable for many ground-staff members.

MARITIME.

Merchant Navy. Apprentices and cadets for deck duties should be tested on Board of Trade Lantern before acceptance. Engine Room Officer cadets and Ratings have a modified colour chart test. The Board of Trade Lantern (similar to Giles-Archer) is used in a dark room.
Fail - red mistaken for green, or vice versa.
Doubtful - if calls white "red", or red "white", or confuses green and white, then case is referred to principal examiner.
Re-test carried out when applying for first certificate of competency.

Royal Navy. Four grades -
- CP1 - correct recognition of Martin Lantern at 6 metres (small aperture)
- CP2 - Pass 13 out of first 15 plates, abridged Ishihara (1969 Ed. under fluorescent daylight lamp (B.S.950 : 1967)
- CP3 - Correct recognition Martin Lantern at 6 metres (large aperture)
- CP4 - Correct recognition of colours in relevant trade situations (wires, resistors, filing tabs etc.)

Method.
Ishihara for all candidates.
If pass, where standard CP1 necessary, proceed to Martin Lantern (small aperture)
If fail, proceed to Martin Lantern (large aperture) or trade test.
Retest carried out by Naval Eye Specialist.

Application of Standards :
CP1 = Seamen Officers and S.D. list, Aircrew
CP3 = Seamen Ratings, Airmen & S.D. list, Marine Officers.
CP4 = Other Grades (a few specialist exceptions)

OTHER GROUPS

Army & Womens Royal Army Corps
" Complete colour blindness" (not specified) may restrict choice of certain specialist arms or corps. (It is believed that "colour safe"- or equivalent of CP2 permits entry to Tank Corps, Signals, Royal Corps of Electrical Mechanical Engineering, but decision will be made by Army Recruiting Board).

Nursing. Civil or Military - no colour standards demanded.

Police. Different regional forces set their own standards but in general major colour defects on Ishihara will be rejected.

Civil Service. Rejection for "colour blindness" in certain posts (e.g. Customs Officer)

Teaching. Specialist teacher of art only considered after receipt of "full report from Ophthalmic Surgeon"

Posts & Telecommunications. Considered in relation to particular occupation intended.

W.O.G. Taylor.

ISRAEL (1972)

	Requirement	Tests
Automobile driving (all kinds)	no limitation (except in railways)	-
Railway - Cat. A-D	normal	Ishihara
Cat. B	no limitation	-
Aviation - Air crews and flight supervisors	normal	Ishihara *
Marine - deck	normal	Ishihara
other	severe deficiencies excluded	Ishihara and other tests
Police	severe deficiencies excluded	Ishihara and other tests

* In some cases, when a mild deficiency (presumably deuteranomaly and amblyopia) is found on Ishihara, a flashlight examination for recognition of major colours is given and those passing it are accepted.

A. Adam.

ANNOUNCEMENT

10th (JUBILEE) SYMPOSIUM ON COLOURISTICS

This Symposium organized by the Section for Colouristics of the Hungarian Chemical Society, the Research Laboratory for Applied Chemistry and Colouristics, and the Hungarian National Colour Committee, Member of the AIC, Budapest, will be held in Eger (Hungary) from 16th to 19th October, 1973.

The subject of Symposium are : some special products of the organic chemical industry; the research, production, analysis and application and related chemical, colouristical and colloid chemical problems of dyestuffs, pigments, paints, auxiliaries, surface active agents, detergents and cosmetics as well as discussion of theoretical and practical problems for colour and colour measuring.

Correspondence relating to the Sympsoium should be adressed to : 10th (Jubilee) Symposium on Colouristics
c/o Hungarian Chemical Society
1368 Budapest 5,
POB 240 (Hungary).