

62522-65

ACCESSION NR: AP5016422

SUBMITTED: 06Jul64

ENCL: 00

SUB CODE: IS

NR REF SOV: 004

OTHER: 002

cc
Card 3/3

RAUTENSHEYN, Ya.I.; FADEYEVA, N.P.

Lysogenic conversions of citrate resistance in *Actinomyces*
venezuelae, Dokl. AN SSSR 161 no.6:1441-1443 Ap '65. (MIRA 18:5)

1. Institut mikrobiologii AN SSSR. Submitted July 28, 1964.

RAUTENSHTEYN, Ya.I.; MISYUREVA, N.G.; KHACHATRYAN, L.S.

Lysogenicity of *Bac. cereus* var. *Galleriae* cultures and the characteristics of phages contained in them. *Mikrobiologiya* 33 no.6:980-986 N-D '64. (MIRA 18:4)

1. Institut mikrobiologii AN SSSR, Moskovskiy zavod bakterial'nykh preparatov i Institut mikrobiologii AN Armyanskoy SSR.

SOLOV'YEVA, N. Ya.; RAUTENSHTEYN, Ya. I.

Effect of indicator culture and culture medium composition on
the result of actinophage titration. Mikrobiologiya 32 no.63
1000-1005 N-D '63 (MIRA 18:1)

1. Institut mikrobiologii AN SSSR.

на ПАРШИВЫХ, Я.е.

Aleksandr Aleksandrovich Imshenetski, 1905- ; on his 60th birthday.
Izv. AN SSSR Ser. biol. 30 no.1:160-161 Ja-F '65.

(MIRA 18:2)

ACCESSION NR: AP4022476

s/0220/64/033/001/0056/0063

AUTHOR: Misyureva, N. G.; Rautenshtoy, Ya. I.

TITLE: Occurrence of Bac. megaterium bacteriophages in certain soils

SOURCE: Mikrobiologiya, v. 33, no. 1, 1964, 56-63

TOPIC TAGS: Bac. megaterium var. phosphaticum, Bac. megaterium bacteriophage, phagolysis, lytic action spectrum, soil isolated bacteriophage, industrial culture bacteriophage, Bac. megaterium culture sensitivity

ABSTRACT: This study was prompted by the problem of phagolysis occurring in industrial fertilizer bacterial preparations, based on Bac. megaterium cultures, at the First Moscow Plant of Bacterial Preparations. Twenty soil samples taken from areas adjacent (10 to 500 m) to the plant were investigated to determine the number of bacteriophages active against Bac. megaterium and their lytic activity. Each soil suspension sample was introduced into two flasks filled with 100 ml of a corn-molasses medium. One of the flasks was thoroughly shaken and then was let stand for 15 to 20 min at room

Card 1/3

ACCESSION NR: AP4022476

temperature (18°) to find free phage particles. The other flask was kept on a rocker for 24 hrs to produce favorable conditions for bacteriophage reproduction on Bac. megaterium cultures present in the soil. A filtrate was prepared from the contents of each flask and several drops were applied to test culture growths of various Bac. megaterium strains in cups containing an agar and a corn-molasses medium. Presence of bacteriophages in test cultures was determined by absence of growth in sections where filtrate was applied. Results for the soil samples showed they contained a significant number of bacteriophages active against Bac. megaterium, especially the samples of soil closest to the plant. Bac. megaterium bacteriophages isolated from the soil samples proved to be highly heterogeneous in their lytic action spectra. Bacteriophages with different lytic action spectra can be found in the same soil sample. Soil isolated bacteriophages have different lytic action spectra than bacteriophages isolated from industrial cultures. Industrial cultures of Bac. megaterium var. phosphaticum vary in their sensitivity to bacteriophages isolated from soil and industrial cultures. Orig. art. has: 4 tables.

Card 2/3

ACCESSION NR: AP4022476

ASSOCIATION: Pervyy moskovskiy zavod bakterial'nykh preparatov i
institut mikrobiologii AN SSSR (First Moscow Plant of Bacterial
Preparations and Microbiology Institute AN SSSR)

SUBMITTED: 09Apr63

DATE ACQ: 09Apr64

ENCL: 00

SUB CODE: LS

NR REF SOV: 006

OTHER: 003

Card 3/3

RAUTENSHTEYN, Ya.I.; RETINSKAYA, V.I.

Comparative study of the effect of specific actinophages of
different virulence on *Actinomyces erythraeus*. *Mikrobiologiya*
32 no.4:642-649 J1-Ag '63. (MIRA 17:6)

1. Institut mikrobiologii AN SSSR.

KHAVINA, E.S.; RAUTENSHTEYN, Ya.I.; ASEM KHUSEYN.

Lysogenesis among the cultures of the *Actinomyces viridochromogenes* group. *Mikrobiologiya* 32 no.3:471-478 My-Je '63 (MIRA 17:3)

1. Institut mikrobiologii AN SSSR i Biologo-pochvennyy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni Lomonosova.

KHAVINA, E.S.; RAUTENSHTEYN, Ya.I.

Bacteriophage against cultures of bacteria from the genus
Caulobacter. Dokl. AN SSSR 153 no.1:197-199 N '63.

(MIRA 17:1)

1. Institut mikrobiologii AN SSSR. Predstavleno akademikom
A.A. Imshenetskim.

FADEEVA, N.P. [Fadeyeva, N.P.]; RAUTENSTEIN, I.I. [Rautenshteyn, Ya. I.];
ELPINER, I.E. [El'piner, I. Ie.]

Influence of ultrasonics on some actinophages and bacteriophages.
Analele biol 14 no.1:39-45 Ja-Mr '60.

SOLOV'YEVA, N.Ya.; KRIVISKIY, A.S.; RAUNTENSHEYN, Ya.I.

Comparative study of some bacteriophages of Bac. megatherium.
Mikrobiologiya 30 no.2:255-260 Mr-Apr '61. (MIRA 1:6)

1. Institut epidemiologii i mikrobiologii imeni Gamaley AMN i
Institut mikrobiologii AN SSSR.
(BACTERIOPHAGE) (BACILLUS MEGATERIUM)

RAUTENSHTEYN, Ya.I.; KHAVINA, E.S.

Actinophages in cultures of the *Actinomyces lavendulae* group and
lysogeny among actinomycetes of this group. *Izv. AN SSSR. Ser.*
biol. no.2:289-298 Mr-Apr '61. (MIRA 14:3)

1. Microbiological Institute, Academy of Sciences of the U.S.S.R.,
Moscow.

(ACTINOMYCES)

(BACTERIOPHAGE)

RAUTENSHTEYN, Ya.M.; MIRZOYEVA, V.Sh.

Aleksandr Markovich Kazakov; obituary. Mikrobiologiya 23 no.6:764
N-D '54. (MIRA 8:2)

(KAZAKOV, ALEKSANDR MARKOVICH, 1883-1954)

RAUTENSHTEYN, Ya. I.

Comparative activity studies of catalases and some other biochemical factors in phage-resistant and phage-sensitive actinomycete strains. A. I. Sokolova and Ya. I. Rautenshteln (Inst. Microbiol., Acad. Sci. U.S.S.R., Moscow). *Mikrobiologiya* 25, 466-70(1958).--The catalase in phage-resistant strains of *Actinomyces globisporus streptomycini*, both in spores and in newly formed mycelia, is more active than in phage-sensitive strains. Fixation of mycelia with EtOH seriously impairs catalase activity, especially in young cultures. Spore catalase has higher soly. in H₂O in resistant than in sensitive strains. Reducing power of young mycelia is higher in sensitive than in resistant strains. No significant difference was observed in sensitivity to NaNO₂ as inhibitor. Julian P. Smith

RAUTENSTRAUCH, St., mgr inz.; ROSCISTEWSKI, W., mgr

Development of the production of detergents and cosmetics in
Poland. Chemik 17 no. 2: 41-44 F '64.

RAUTIAN, G. N.

"More Concerning the Flights of Rocket Missiles,"

Priroda, No 1, 1948

RAUTIAN, G. N.

2/1975

USSR/Geophysics
Fog
Weather

Jan 48

"White Rainbow," G. N. Rautian, 1½ pp

"Priroda" No 6

Formation of a "white rainbow" is the result of the reflection of light from low-lying fog and mist, usually visible over marshes. Rautian discusses occurrence of several of these rainbows.

2/1975

RAUTIAN, G. N.

"New Data on the Upper Layers of the Atmosphere"

Priroda, No 9, 1948

RAUTIAN, G. N., Lobanova, N. V.

"Small Fields in Colorimetry"

Dok. AN, 66, No 5, 1969

USSR/Physics - Colorimetry

21 Oct 49

"Large Fields in Colorimetry," N. V. Lobanova,
G. N. Rautian

"Dok Ak Nauk SSSR" Vol LXVIII, No 6, pp 1025-1028

Expt with large fields of vision showed use of field
of $5-6^\circ$ in 3-color colorimeters may increase
accuracy of color measurements by about $1\frac{1}{2}$ times.
If field is increased to 10° , accuracy can be doubled
in comparison with standard field of vision of 2° .
Submitted by Acad S. I. Varilor 22 Aug 49.

172100

RAUTIAN, G. N.

1667101

USSR/Physics - Instruments, Optical
Eye 1 Jul 50

"A New Anomaloscope," G. N. Rautian, State Opt
Inst

"Dok Ak Nauk SSSR" Vol LXXIII, No 1, pp 99-102

Describes principle of new anomaloscope which tests
separately sensitivity of each of three Young eye
receptors by gradually varying action on one recep-
tor while action on other two is kept constant. Test-
ing is by varying color of one of two half-fields
juxtaposed in instrument. Submitted 8 May 50 by
Acad S. I. Vavilov.

1667101

RUSSIAN S. V.

IA 172T 9

USSR/Physics - Color Vision

21 Oct 50

"Investigation of the Color Vision of 995 Individuals," G. N. Rautian

"Dok Ak Nauk" Vol LXXIV, No 6, pp 1073-1076

Statistical distribution (3 Gaussian curves) describing deviation from normal of red, green, blue vision of 995 subjects. Submitted 26 Jun 50 by S. I. Vavilov.

172T89

S.A.

Optics

sect. A

2817. *Uniformity of definitions in colorimetry.* 333.6.00
 G. N. LATTMAN. *Br. J. Appl. Phys.*, 24, 507-8 (Apr. 1, 1973) *In English.*

It is suggested, in order to avoid confusion: (1) to use X, Y, Z for the co-ordinates of the international system of co-ordinates, while x, y, z ought to designate the colour components along the axis of this system; (2) u, v, w should be used only for the tristimulus coefficients; (3) other lower-case letters should be used for the tristimulus co-ordinates of the international system; and (4) $\rho(\lambda), \gamma(\lambda)$ should be used instead of R, Y, B for designating the co-ordinates of the equal-energy spectrum. P. LATTMAN

RAUTJAN, G. N.

Relation of the Weber-Fechner's law to color-sensitive receptors
of the eye. Doklady Akad. nauk SSSR 79 no.1:65-68 1 July 1951.
(CIAM 21:1)

1. Presented 3 May 1951 by Academician A. N. Terenin.

BAUTYAN, G.N.

Classification of form of color vision. Doklady Akad. nauk SSSR 81
no.5:815-818 11 Dec 51. (CIOL 21:5)

1. Presented by Academician A.N. Terenin 11 October 1951.

RAUTIAN, G. N.

USSR/Physics - Light Filters

Apr 52

"Monochromatic Light Filters," N.I. Speranskaya,
G.N. Rautian

"Zhur Tekh Fiz" Vol XXII, No 4, pp 620-624

Describes monochromatic light filters having maxima at a distance of 20 to 30 Å and a background not over 75 Å. Derives formulas for optical light-filtering. Concludes that the best filters are interference monochromators combined with colored glass. Received 6 May 51.

2167100

RAUTYAN, G.N.

Light adaptation and threshold of light discrimination. Doklady Akad.
nauk SSSR 92 no.2:297-299 11 Sept 1953. (CLML 25:4)

1. Presented by Academician A. N. Terenin 11 July 1953.

RAUTYAN, G.N.

Thresholds of light discrimination. Doklady Akad. nauk SSSR 92 no.5:
943-946 11 Oct 1953.
(CML 25:4)

1. Presented by Academician A. N. Terenin 11 July 1953.

YUSFIN, A.I.;FRANTSSEN, B.S.;RAUTYAN, G.N.

Effect of hypoxia on color vision. Doklady Akad. nauk SSSR 92 no.6:
1153-1156 21 Oct 1953. (CML 25:4)

1. Presented by Academician K. M. Bykov 27 August 1953.

BAUTIAN, G.N. doktor tekhnicheskikh nauk.

Measuring color. Tekst.prom.14 no.12:37-38 D'54. (MIRA 8:2)
(Color measurement)

BAUTIAN, G.N. (Leningrad)

Classification of color vision. Vest. oft. 33 no.4:15-18 Ji-Ag '54.
(MLRA 7:8)

(COLOR VISION,
*classif.)

RAUTIAN, G.N. (Leningrad)

New anomaloscope. Vest. oft. 33 no.4:18-23 J1-Ag '54. (MIRA 7:8)
(OPHTHALMOLOGY, apparatus and instruments,
•anomaloscope)

RAUTIAN, G. N. And SOLOV'YEVA, V. P.

"Effect of Light Background on Sharpness of Color Discrimination," Dokl.
AN SSSR, 95, No.3, pp. 513-516, 1954

Translation X-1568

Abstract A-53199, 23 Jul 56

RAUTMAN, G. N.

~~RAUTMAN, G. N.~~

USSR/Biophysics

Card 1/1

Authors : Rautman, G. N. and Solov'eva, V. P.

Title : Effect of brightness level on the sharpness of color discrimination

Periodical : Dokl. AN SSSR 95, 6, 1189 - 1192, 21 Apr 1954

Abstract : Describes an experimental determination and study of thresholds of color discrimination. The experiment has been performed with the help of a tube-photometer, two colorimeters coupled together, and specially arranged revolving discs whose color brightness and size could be regulated. Diagrams.

Institution :

Submitted : 11 Feb 1954

RAUTIAN, G.N.

"Polychromatic tables for testing color perception." E.B.Rabkin.
Reviewed by G.N.Rautian. Vest.oft. no.3:46-47 My-Je '55. (MIRA 8:6)
(COLOR SENSE)
(RABKIN, E.B.)

F. THE S.G. (1) - (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

graphic representation of case. Text. area. 15 us. 1/2 - 1/4
page 155. (155)

(155 for measurement)

RAUTIAN, G.N., doktor tekhnicheskikh nauk.

Colorimetric analysis of color fastness standards. Tekst. prez.
15 no.11:33-34 N '55. (MLA 9:1)

(Colorimetry) (Dyes and dyeing)

RAUTIAN, G.N.

Color discrimination in anomalous trichroism. Dokl. AN SSSR 111
no.1:92-93 N-D '56. (MLRA 10:2)

1. Predstavleno akademikom A.N.Tereninym.
(COLOR SCIENCE)

RAUTIAN, G.N.

535.65 : 635.89

8139. SOURCES OF ILLUMINATION IN ACCURATE COLOUR MEASUREMENTS OF NON-SELF LUMINOUS BODIES.

G.N.Rautian, N.V.Lobanova and M.A.Znamenskaya. *Zh. tekhn. Fiz.*, Vol. 26, No. 1, 193-202 (1956). In Russian.

Recommends replacing Davis and Gibson's liquid filters (International Commission on Illumination, 1931), used in conjunction with a lamp standardized by its colour temperature, by theoretical standards based on Planck's law for an absolutely black body. It is claimed that triple-glass light filters developed in the U.S.S.R. by Ronis in 1948 are more convenient in use, more accurate and ensure better standardization than liquid filters. A method is described of designing compound glass filters that, combined with the standard source A_2 (2854°K; a substandard electric incandescent lamp with W spiral is actually proposed), would yield the white illumination sources B_2 and C_2 .

F.Lachman

Phys

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SMW

MRC

RAUTIAN, B.M.

✓ The feasibility of measuring the refractive index of crys-
talline substances by use of the Abbé type refractometer.
G. N. Rautian and B. P. Ioffe. *Zhur. Tekh. Fiz.* 26, 1803-
4 (1950). A polemic discussion of Nechal's article (*C.A.*
51, 292). Paul Paliyenko

4/11
1/2

RAUTIAN, G.N.

5000

535.321
1994. ON THE ARTICLE BY F. NECHAI "ON THE POSSIBILITY OF MEASURING THE REFRACTIVE INDEX OF CRYSTALLINE MATERIALS IN AN ABBE-TYPE REFRACTOMETER". 2

G.N. Rautian and B.V. Ioffe.

Zh. tekh. Fiz., Vol. 26, No. 9, 2129-30 (1956). in Russian. See Abstr. 8648 (1956). The authors are surprised and therefore reject what are called Nechal's obvious deviations from elementary laws of refractometry. They maintain that any arbitrary liquid cannot be used for making contact, and that the method proposed is without value since anisotropy is ignored. J. Jacobs

rlp

SP
JG

LOBANOVA, N.V.; RAUTIAN, G.N.; SPERANSKAYA, N.I.

Spectral characteristics of color vision. *Biofizika* 8 no.4:
502-508 '63. (MIRA 17:10)

EXCERPTA MEDICA Sec.12 Vol.10/8 Ophthalmology Aug56

1188. RAUTIAN G. N. *Correction of anomalous colour vision with light filters. DOKLADY AKAD. NAUK SSSR 1955, 104/2 (219-222) Graphs 2 Tables 5 (Russian text)

On the grounds of recent investigations it is suggested that the anomalous trichromatic colour system is due to an unfavourable distribution of pigment in the retina, or to the presence of abnormal pigments. The possibility of imitation or correction of such a condition with filters was investigated, using a combined filter in a series of tests on typical deuteranomalous subjects. It is concluded that some slight measure of correction can be obtained with filters. The investigation thus has a certain practical value, but it would be incautious to state that a true correction of a defective colour system of the eye can be effected in this way.

Von Skramlik - Berlin (II, 12)

RAUTIAN, G.N.; LOBANOVA, N.V.; ZNAMENSKAYA, M.A.

On light sources in the precision photometry of nonluminous
objects. Zhur.tekh. fiz. 26 no.1:193-202 Ja '56.(MLRA 9:6)
(Photometry) (Light filters)

RAUTIAN, G.N.

SUBJECT
AUTHOR
TITLE
PERIODICAL

USSR / PHYSICS

CARD 1 / 2

PA - 1404

RAUTIAN, G.N., JOFFE, B.W.

On the Article by F. NEČAJ "Concerning the Possibility of Measuring
the Refraction Index of Crystalline Bodies on the Refractometer,
Type Abbe".

Žurn. techn. fis, 26, fasc. 9, 2129-2130 (1956)
Issued: 10 / 1956 reviewed: 10 / 1956

The article by F. NEČAJ on measuring refraction indices of crystals on the "Abbe type" refractometer is surprising because of the fact that it is contradictory to the generally known principles of refractometry which can be proved in an elementary manner.

On page 437 (Žurn. techn. fis, 26) the authors make the statement that "any" liquid may serve as a liquid layer between the prism of the Abbe-refractometer and the sample to be investigated, "as long as it moistens the crystal". The elementary truth, however, which is always repeated in instructions of use issued together with this apparatus is that the refraction index of the liquid intermediary layer must be greater than that of the sample to be investigated. Consequently, it is not possible to use just "any" liquid, nor is it possible that this layer consists merely of air (if the sample is placed upon the prism in a "dry" condition), which fact the authors shortly mentioned on page 437.

It is incomprehensible how it was possible for the authors, on the Abbe-refractometer, to find the refraction indices (from 1,52 to 1,56) of the substances enumerated in table 1 if water was used as an intermediary layer ($n_D = 1.333$). It is quite impossible that the authors were able to see boundaries which actually corresponded to the limiting angle for glass and for the mica which were laid one

Zurn.techn.fis,26, fasc.9, 2129-2130 (1956) CARD 2 / 2

PA - 1404

on top of the other and were moistened with water "for the purpose of establishing contact". The authors alleged that the refraction indices of the crystalline fragments, i.e. bodies of irregular shape, are measurable "by pouring a liquid on to the prisms of the refractometer where the crystal is mounted for the purpose of establishing an optical contact". By studying the text of the article, however, we find that the authors' statement is without foundation, because they carried out their experiments with small plates having a smooth surface and not with irregularly shaped fragments. The fact that the Abbe-refractometer is useless for work carried out with anisotropy crystals is not due to the "dispersion of light on the boundaries where contact between prisms and crystals exists", as the authors vaguely alleged (p.436), but to the difficulties arising from the precise orientation of the crystal with respect to the surface of the refraction rays, the latter being necessary when working with anisotropic bodies by the method of the limiting angle. It is surprising that, when investigating the question as to measuring the refraction index of crystals, F.NEČAJ completely ignores the anisotropy of the refraction of light in crystals. For such typically anisotropic bodies as gypsum, ice, acetamide, etc., the authors mention only one refraction index although it is generally known that anisotropic crystals are characterized by two or three different indices. As to the crystallization of the substance on the prism of the refractometer, which is suggested by the authors, it must be said that this method has already been known for a long time as being applicable in the case of easily melting isotropic bodies, but for anisotropic bodies it is obviously useless because of the indefinite orientation of the crystal obtained in the polycrystalline plate if it is intended to measure with some degree of accuracy.

INSTITUTION:

RAVIAN, G.N.

Correction of anomalous color vision by light filters. Dokl. AN SSSR
104 no.2:219-222 S '55. (MIRA 9:2)

1. Predstavleno akademikom A.N. Tereninym.
(Color sense) (Light filters)

RAUTIAN, G.N.

6702. Correction of anomalous colour vision by light-filters.
G. N. Rautian *Dokl. Akad. Nauk, S.S.S.R.*, 1953, 104, 219-222;
Referat. Zh. Biol., 1956, Abstr. No. 74360.—Light-filters were constructed of three layers of coloured glass (SZ5-3, 0.4 mm. FS-6, 1 mm. ZHS-3, 1.8 mm.) and were tried on deuteranopes. In 8 cases normal, or even somewhat super-normal colour discrimination was attained. A satisfactory correction was not obtained in protanopes with these filters. (Russian) T. R. FARSONS

IOFFE, Boris Veniaminovich; RAUTIAN, G.N., doktor tehnikeskikh nauk, redaktor;
SHCHERBAKOVA, G.A., redaktor; LANOVA, A.V., tekhnicheskiy redaktor.

[Manual on refractometry for chemists] Rukovodstvo po refraktometrii
dlia khimikov. [Leningrad] Izd-vo Leningradskogo univ., 1956. 209 p.
(Refractometry)

RAUTYAN, G.N.

New classification of the forms of color sense. Biofizika 1 no.3:
245-253 '56. (MLRA 9:9)

1. Gosudarstvennyy opticheskiy institut imeni S.I.Vavilova, Lenin-
grad.
(COLOR SENSE)

RAUTIAN, G. N.

1953. COLOUR DISTINCTION IN ANOMALOUS TRICHROMATS. ²¹

G. N. Rautian

Dokl. Akad. Nauk SSSR, Vol. 111, No. 1, 92-3 (1953). In Russian.

Presents the results of measurements of the colour distinction thresholds for different colours (in the form of threshold ellipses), for a normal trichromat as well as for different anomalous trichromats. The apparatus used was a double trichromatic colorimeter described in a previous paper (Dokl. Akad. Nauk SSSR, Vol. 92, No. 5 943, 1953). The results confirm that original idea of Rayleigh, viz. that the anomaly is a kind of colour vision, independent of the level of the acuity of colour distinction. The system of colour determination in an observer with anomalous colour distinction is, in general, not related to that possessed by a normal trichromat. The ellipses obtained should be considered as representations, in the chromaticity-graph plane, of the threshold colour inequalities for the anomalous subjects, as they are seen by a normal eye. The coefficients of

2

close values of n_A , the threshold ellipses can vary within wide limits.
F. Lachman

g/c
MT

51-6-26/26

AUTHOR: None given.

TITLE: XI Lecture imeni Academician D.S. Rozhdestvenskiy.
(Odinnadtsatyee chteniya imeni akademika D. S. Rozhdestvenskogo.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.II, Nr.6,
p. 828. (USSR)

ABSTRACT: Complete Translation.

The XI Rozhdestvenskiy Lecture, named after one of the founders of the State Optical Institute imeni S.I. Vavilov, took place at that Institute on 16th May 1957. Two papers were presented at this lecture.

In his paper "On Colour Vision", Prof. G.N. Rautian
APPROVED FOR RELEASE: Tuesday, August 01, 2000
energy which, as a first step, limits, orders and analyzes
the information received by the eye and then compresses
this information for coded transmission to the brain.

Card 1/4

51-6-26/26

XI Lecture imeni Academician D.S. Rozhdestvenskiy.

The three-dimensional character of colour as a retinal stimulus forms the basis of measurement of colour and its representation in an affine vector space. Of great importance is the problem of the basic physiological system of colour determination since the coordinates of colour in that system characterise the spectral sensitivity of the three types of receivers on the retina.

Rautian discussed the method of finding directions of the physiologically important coordinate axes by tests using dichromats reported in the Yustova-Nyuberg work. He also discussed other methods used in USSR and based on dichromatism which is either temporal (N.T. and V.N. Fedorov) or spatial (M. Bongard and M. Smirnov).

Establishment of spectral sensitivity curves of the retinal receivers would lead to the most direct methods of study of colour vision. This was shown on the example of a new anomaloscope $\Gamma\Omega$ and the results obtained with it which widen our knowledge of the

Card 2/4

51-6-26/26

XI Lecture imeni Academician D.S. Rozhdestvenskiy.

multiplicity of forms of colour vision and permit us to construct a more elastic and precise classification of these forms. Another example quoted was the proposal for rationalisation of street traffic signals to make them correctly understood by all dichromats.

At the end of the paper the author discussed some new attempts at interpretation of the phenomena which form the basis of selective sensitivity of the retinal receivers.

Candidate of physico-mathematical sciences M.P. Vanyukov presented a paper on "Emission by a High-temperature Pulse Discharge".

This paper presented the results of the study of certain optical characteristics of spark discharges in heavy inert gases (argon, krypton and xenon) at pressures of 4-10 atm. Using a new photoelectric

Card 3/4

51-6-26/26

XI Lecture imeni Academician D.S. Rozhdestvenskiy.

technique temporal variations of the discharge were recorded in the spectral region from 2500 to 10000 Å and dynamics of the variation of the form of arc lines in the process of discharge was determined with resolution in time of 10^{-7} sec and in wavelength of 1 Å. The brightness of the spark-discharge channel has a limiting value which in xenon at 5 atm is about 11×10^6 stilbs. In capillary-tube discharges brightness increased continuously with increase of the discharge energy and no saturation in brightness was observed. In the capillary discharges brightnesses up to 50×10^6 stilbs and temperatures up to 94000°K were obtained.

AVAILABLE: Library of Congress.

Card 4/4

Handwritten: 1. 11. 1957

AUTHORS: Lobanova, N. V. and Rautian, G. N. 51-1-12/18

TITLE: New Tables for Calculation of Colour Coordinates.
(Novyye tablitsy dlya rascheta koordinat tsveta.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr.1, pp.77-81.
(USSR)

ABSTRACT: In colorimetry of non-selfluminous objects the International Commission on Illumination recommended in 1931 the use of three sources: A, B and C (Refs. 1, 2). In realization of these sources the following were used: (1) a gas-filled lamp with a colour temperature of 2854°K (source A); (2) the same lamp but with a liquid light-filter of Davis and Gibson (source B with a colour temperature of about 4800°K); (3) the same lamp with another liquid light-filter of Davis and Gibson (source C with a colour temperature of about 6500°K) (Ref.3). In 1955 the Soviet Union introduced a standard ГОСТ 7721-55 which defines sources B and C as bodies emitting strictly according to Planck's law at colour temperatures of 4800 and 6500°K respectively (Ref.4). To use with the latter standard, the authors give in the present paper tables of spectral distributions of radiant energy density

Card 1/2

LOBANOVA, N.V.; RAUTIAN, G.N.

New tables for the calculation of color coordinates. Opt. spektr.
3 no.1:77-81 J1 '57. (MLBA 10:8)
(Color--Tables, etc.)

AUTHOR: Rautian, G.N.

51-2-14/15

TITLE: On M. M. Gurevich's paper on the State Standard (ГОСТ)7721-55.
(Po povodu stat'i M. M. Gurevicha o GOSTe 7721-55)

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy),
1957, Vol.3, No.2, pp.189-190 (USSR)

ABSTRACT: Reply to Gurevich's (Opt. i Spektr. 3,187,1957, see the preceding abstract) criticism of the Soviet Standard 7721-55 on colorimetry. The present author points out that the use of liquid colour filters of Davis and Gibson /Ref.2/, recommended by the International Commission on Illumination in 1931, is very troublesome and the results are not precisely those which were intended. The new Soviet State Standard 7721-55 recommends centrally-prepared glass colour filters. These are more permanent and easier to use. When properly calibrated the glass filters are expected to give better approximations to theoretical spectral distributions. There are 5 references, 3 of which are Slavic. References cited: /2/

AVAILABLE: Library of Congress

Card 1/1

RAUTIAN, G.N.; LOBANOVA, N.V.; SPERANSKAYA, N.I.

Thresholds of color differentiation in a concentrated expression for
images on the positive of color film. Usp. nauch. fot. vol. 5:145-160
'57. (MIRA 10:6)

(Color photography)

(Photographic chemistry)

USSR / Human and Animal Physiology. Sense Organs.

Abs Jour : Ref Zhur - Biol., No 15, 1958, No. 70603

Author : Rautian, G. N.

Inst : Not given

Title : The Problem of the Thresholds of Color Discrimination
(Certain Observations on the Article by MacAdam Concerning our Work on Color Discrimination)

Orig Pub : Biofizika, 1957, Vol 2, No 5, 637-641

Abstract : No abstract given (See Rumanian Journal of Biology,
1957, 43244)

Card 1/1

152

RAUTIAN, G.N.; GUR'YEVA, M.K.

Color discrimination of point sources. Dokl.AN SSSR 112 no.6:1037-1040
F '57. (MLRA 10:5)

1. Predstavleno akademikom A.N. Tereninym.
(Color sense)

RAUTIAN, G.N.

A new anomaloscope [with summary in English]. Biofizika 2 no.6:734-742
'57. (MIRA 10:12)

1. Gosudarstvennyy opticheskiy institut im. S.I. Vavilova.
(COLOR SENSE) (OPTICAL INSTRUMENTS)

RAUFIAN, G.H.

On M.A. Gurevich's note concerning the All-Union State
Standard no. 7721-55. Opt. 1 spektr. 3 no. 2: 189-190 Ag '57.
(MLRA 10:8)

(Spectrum analysis--Standards)

RAUTIAN, G. N.

AUTHOR: RAUTIAN, G. N., GUR'EVA, M. K.

PA - 2336

TITLE: Color Discrimination of Point Sources. (Tsvetorazlicheniye tochechnykh istochnikov, Russian).

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 112, Nr 6, pp 1037 - 1040 (U.S.S.R.)

Reviewed: 5 / 1957

Received: 4 / 1957

ABSTRACT:

The present work determines the differences between the colors of some punctiform signals immediately on the thresholds by means of a double three-color colorimeter (G. N. RAUTIAN, Dokl. Akad. Nauk, 1953, Vol 92, Nr 5, 945). The 5 colors chosen for this purpose are similar to the colors used in usual signal technique. The coordinates of these colors are given in a table in the apparatus system and in the international system. Measurements were carried out by two observers with normal ability for color discrimination and the average of the values found by them was taken. The numbers of the thresholds for all 5 colors were determined; they are nearly constant. Therefore, angular dimensions of the sources within certain limits exercise no influence on the sharpness of color discrimination. Such sources can in fact be regarded as punctiform. At from $8 \cdot 10^{-5}$ to $4 \cdot 10^{-7}$ lux the number of thresholds among colors changes in the case of a 90-fold modification of illumination strength only by about the 2- to 6-fold. Dependence on the logarithm of illumination is linear.

Card 1/2

PA - 2336

Color Discrimination of Point Sources.

For the purpose of investigating the influence of the disparate location of the sources of color discrimination the number of thresholds was determined for points which had a constant angular diameter of $5'$ and were separated from one another by $10'$, $30'$, 1° , 3° , and 5° . The sharpness of color discrimination has a weakly marked maximum at the distances between points and 1° , which, in the case of a low number of thresholds, is nearly equalized. Color discrimination in the case of punctiform sources is many times (by about the 5- to 15-fold) inferior than in the case of extended sources. Besides, these differences for different pairs of color are different.

The rules found here are of importance for colored signalization over large distances. (3 illustrations and 4 tables)

ASSOCIATION: Not given
PRESENTED BY: Member of the Academy A.N.TERENIN.
SUBMITTED: 2.7.1956
AVAILABLE: Library of Congress.

Card 2/2

20-1-15/44

AUTHORS: Rautian, G.N., Lobanova, N.V.

TITLE: Relationship between the Color Spaces of Normal and Abnormal Trichromates (Sootnosheniye tsvetovykh prostranstv normal'nogo i anomal'nogo trikhromatov)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 1, pp. 56 - 59 (USSR)

ABSTRACT: At present it may be assumed that at least the deuteranomalous are distinguished from normal observers by modified curves of the spectral sensitivity $\gamma'(\lambda)$ of their receivers which are "sensitive to green" (which do not operate in the case of deuteranopes). Therefore, they have their own manifoldness of colors which, like the color space of normal trichromates may be considered to be an affine three-dimensional vector space. Every point of such a space can be brought into a univocal relation with a point of the ordinary Euclidian space for the purpose of geometric representation. Because of the difference of the spectral sensitivity of the receiver, the color vector corresponding to a certain spectral distribution of radiation density (in the case of a common system of coordinates) must, in the case of an anomalous trichromate, take up a position that is different from

Card 1/3

Card

Relationship between the Color Spaces of Normal and Abnormal Trichromates 20-1-15/44

PRESENTED: April 18, 1957, by V.P. Linnik, Academician
SUBMITTED: April 3, 1957
AVAILABLE: Library of Congress

Card 3/3

RAUTIAN, G.N.

Color discrimination thresholds. Probl.fiziol. opt. 12:207-218 '58
(MIRA 11:6)

(COLOR SENSE)

BAUTIAN, G.N.

Variations of dichromatic color vision. Dokl. AN SSSR 133
no.1:225-227 J1 '60. (MIRA 13:7)
(COLOR SENSE)

LOBANOVA, N.V.; FILIPPOVA, N.K.; SHAROVA, Z.P.; RAUTIAN, G.N.

Methods of colorimetric determination and specification of fabrics.
Tekst. prom. 21 no. 4:52-54 Ap '61. (MIRA 14:7)
(Colorimetry) (Textile fabrics—Testing)

RAUTIAN, G.N.

Tests of new functions of color composition. Trudy Inst.Kom.
stand., ser 1 izm.prib. no.56:113-117 '61. (MIRA 15:12)

1. Predsedatel' kolorimetricheskoy komissii pri Vsesoyuznom
nauchno-issledovatel'skom institute metrologii im. D.I.
Mendeleyeva.

(Color measurement)

S/058/62/000/011/024/061
A160/A101

AUTHOR: Rautian, G. N.

TITLE: Land's experiments with a two-color projection

PERIODICAL: Referativnyy zhurnal, Fizika, no. 11, 1962, 29,
abstract 11G261 ("Tr. Leningr. o-va yestestvoispyt.", no. 1,
1961, 72, 148 - 150)

TEXT: A summary of a report read at the Leningradskoye otdeleniye Ob-
shchestva yestestvoispytateley (Leningrad Branch of the Society of Naturalists)
in connection with Land's publication on the "striking new theory of color".

[Abstracter's note: Complete translation]

Card 1/1

ROZHDESTVENSKIY, Dmitriy Sergeevich, akademik; LINNIK, V.P.,
akademik, red.; LEBEDEV, A.A., akademik, red.;
TUDOROVSKIY, A.I., red.[deceased]; FRISH, S.E., red.;
LUIZOV, A.V., doktor fiz.-mat. nauk, red.; RAUTIAN, G.N.,
doktor tekhn. nauk, red.[deceased]; PENKIN, N.P., doktor
fiz-mat. nauk, red.; KIRIKOVA, G.L., red.izd-va; SOROKINA,
V.A., tekhn. red.

[Selected works] Izbrannye trudy. Moskva, Izd-vo "Nauka,"
1964. 348 p. (MIRA 17:4)

1. Chlen-korrespondent AN SSSR (for Tudorovskiy, Frish,
Luizov, Rautian, Penkin).

RAUTIAN, S. G.

USSR/ Physics - Spectral analysis

Card 1/1 Pub. 43 - 19/62

Authors : Bazhulin, P. A.; Rautian, S. G.; Sokolovskaya, A. I.; Sushchinskiy, M. M.

Title : Methods of studying the widths of combined light diffusion lines

Periodical : Izv. AN SSSR. Ser. fiz. 18/6, 678-679, Nov-Dec 1954.

Abstract : The results obtained during the study of various methods for measuring the width and contour of combined light diffusion lines are briefly outlined. The possible distortion factors which may effect the width and form of the lines are listed. It is shown that the distorting effect of each of the factors depends not only upon the width but also the form of the test mechanism functions as well as the form of the diffusion lines investigated. Three USSR references (1941-1953). Table.

Institution : Acad. of Sc., USSR, The P. N. Lebedev Phys. Inst.

Submitted :

FD-988

USSR/Physics - Raman effect

Card 1/1 Pub. 146 - 12/20

Author : Rautian, S. G.

Title : Selection of the condenser in the investigation of combination scattering of light [Raman effect]

Periodical : Zhur. eksp. i teor. fiz., 27, No 5 (11), 625-635, Nov 1954

Abstract : The author gives the calculations for the design of condenser systems used in the photographic and photoelectric recording of spectra of combination scattering. He acknowledges the posing of the problem by Academician G. S. Landsberg and the assistance of V. I. Malyshev.

Institution : Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

Submitted : January 12, 1954

USSR/Physics - Raman spectra

FD-3253

Card 1/1 Pub. 146 - 12/44

Author : Bazhulin, P. A.; Rautian, S. G.; Sokolovskaya, A. I.; Sushchinskiy, M. M.

Title : Methods for the investigation of the width of lines of combination scattering of light and their application

Periodical : Zhur. eksp. i teor. fiz., 29, No 6(12), Dec 1955, 822-829

Abstract : A consideration of the influence of various factors upon the observed width of combination-scattering lines, and a description of methods for the exclusion of these factors' influence upon the results of measurements. The authors present the results of measurements of the width of a number of combination-scattering lines in a prismoid spectrograph with large dispersion. They compare the obtained data with data found by other methods. The authors thank Academician G. S. Landsberg for his advice and Kh. Ye. Sterin, V. T. Aleksanyan for the preparation of the data. Seventeen references: e.g. Kh. Ye. Sterin, Dissertation, Physical Institute im. P. N. Lebedev, Acad. Sci. USSR, 1949.

Institution : Physical Institute imeni P. N. Lebedev, Academy of Sciences USSR

Submitted : July 15, 1954

✓ Effect of curvature of spectral line on the form of transmission function in monochromator, S. G. Rautian. *Optika i Spektroskopiya* 1, 1000-8(1958), 11th. The effect of noncompensating curvature on the precision of graduation according to wave length was calcd. The optimum height of the slit, with respect to the light power ratio and the resolution, was derived. 12 references.

A. P. Kotloby

Physical Inst. im. P. N. Lebedev, Acad. Sci. USSR

RAUTIAN, S.G.

Illumination of spectrographs by volume light sources. Opt.
i spektr. 1 no.3:439-440 J1 '56. (MLBA 9:11)

1. Fizicheskiy institut imeni P.N.Lobedeva AN SSSR.
(Spectrograph)

RAUTIAN, S. G.

Methods of investigation of the line width of Raman lines and their application. P. A. Bazhulin, S. G. Rautian, A. I. Sokolovskaya, and M. M. Sushchinskii. *Soviet Phys., JETP* 2, 663-9(1956) (Engl. translation).—See B. M. R. *Phys* 4
—C.A. 50, 5404c.

RAUTIAN, S.G.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1437
 AUTHOR RAUTIAN, S.G.
 TITLE On a Measure for the Resolving Power of an Optic Device.
 PERIODICAL Dokl. Akad. Nauk, 109, fasc. 4, 743-745 (1956)
 Issued: 10 / 1956 reviewed: 10 / 1956

The distribution of the amplitude $\varphi(x)$ in the image of a onedimensional object is described by the following integral expression: $\varphi(x) = \int_{-\infty}^{+\infty} a(x-y)\Psi(y)dy$. (1)

Here $\Psi(x)$ is the distribution of the amplitude in the object. For optic devices (which, from the point of view of geometric optics are ideal) with gap-like apertures usually the following formula is assumed to apply:
 $a(x) = (1/\pi)\sin x/x$; $A_f = 1$ for $|f| < 1/2\pi$ and $A_f = 0$ for $|f| > 1/2\pi$.

Next, KOTEL'NIKOV'S theorem and views expressed on the same subject by G. TORALDO DI FRANZIA, J. Opt. Soc. Am., 45, No 7, 497 (1955), ibid. 46, No 1, 72 (1956) are discussed. On this occasion it is shown that the opinion expressed by G. TORALDO DI FRANZIA, that optical devices may be accurately described by the above functions A_f is alleged to be wrong, for the spectrum of the image is, strictly speaking, infinite. In an approximated solution of the diffraction problem the frequencies exceeding a certain limit are lacking in the optical image. However, this does not apply in the case of an exact computation of diffraction in the aperture.

In addition, the twodimensional problem of the diffraction of a light wave on a plane screen is investigated, and the following distribution of the field in the

Dokl. Akad. Nauk, 109, fasc. 4, 743-745 (1956) CARD 2 / 2 PA - 1437

image is obtained: $\varphi(x) = A \int_{-\infty}^{\infty} [ik\varphi(f) + \partial\varphi/\partial n] e^{i2\pi fx} df$. Thus, the spectrum ϕ_f is proportional to the linear combination $ik\varphi + \partial\varphi/\partial n$. According to the formulae mentioned above φ and $\partial\varphi/\partial n$ would vanish simultaneously on the screen which is absurd from a physical point of view. Just because this is impossible the spectrum of the optical image is strictly speaking unlimited.

Thus, the conditions of KOTEL'NIKOV'S theorem are not satisfied and $\varphi(x)$ cannot be clearly determined by its values in a discrete sequence of points. Such representations are suited only for a more or less exact interpolation, in which connection the necessary degree of approximation apparently depends on measuring accuracy.

It follows from all that has been said that optical devices are no exception to the rule among all other linear transmission systems. The only difference could be that the number N of the degree of freedom depends on the noise level. It is therefore not possible to introduce a quantitative measure of acuity that is independent of measuring errors. All these conclusions apply also to the threedimensional case and even to self-luminescent objects. These deliberations refer only to the problem of the number of degrees of freedom of the image, but the main problem, i.e. that of the uniqueness of the solution of (1) remains unsolved.

INSTITUTION: Physical Institute "P.N. LEVEDEV" of the Academy of Science in the USSR.

KHUTJAN, J

ПРИКОТ'КО, А. Ф.

24(7) p 3 PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy I Vsesoyuznogo sveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Lavsherg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Yabritskiy, V.A., Doctor of Physical and Mathematical Sciences, Kornitakiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Milyanchuk, V.S., A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Listsa, M.P. Spectrophotometric Study of the Dispersion and Absorption of Solids	97
Podlovchenko, R.I., and M.M. Sushchinskiy. Use of Electronic Computers for the Calculation of Frequencies of Molecular Vibrations	99
Petrash, G.G., S.G. Reutian. Accuracy of the Measurement of Optical Density	102
Reutian, S.G., G.G. Petrash. Accuracy in Measuring the Narrow Absorption Lines While Excluding the Apparatus Function	107
Velichkina, T.S., L.F. Mikhayeva, and I.A. Yakovlev. Molecular Dispersion of Light During Phase Transformations in Solids	111
Ginzburg, V.L. Scattering of Light Near the Phase-transition Points	115

Card 8/30

RAUTIAN, S. G. Cand Phys-Math Sci -- (diss) "Theory of reduction ^{to} the ideal
spectrum ^{device} apparatus? Mos, 1957. 7 pp 21 cm. (Physics Inst im P. N. Lebedev, Acad Sci
USSR), 125 copies (KL, 24-57. 115)

Reported also in Vest Ak Nauk 27 No 12 1957 p. 109-111

RAUTIAN, S.G.

On the theory of the echelette. Opt. 1 spektr. 2 no.2:279-280 P '57.
(MLRA 10:3)

1. Fizicheskiy institut AN SSSR, Opticheskaya laboratoriya.
(Spectrum analysis)

PETRASH, G.G.; RAUTIAN, S.G.

Consideration of distortions in the apparatus and the characteristics
of infrared spectrophotometers. Inzh.-fiz.zhur. no.7:61-71 J1 '58.
(MIRA 11:8)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR, Moskva.
(Spectrophotometer)

PEPRASH, G.G., RAUTIAN, S.G.

Optical conditions for measuring optical density with reduction
to an ideal instrument. Inzh.-fiz.zhur. no.11:80-91. N 158.

(MIRA 12:1)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR, g.Moskva.
(Spectrophotometer)

7(0), 24(7)
AUTHOR:

Rautian, G. G.

SOV/53-66-3-4/7

TITLE:

New Devices and Measuring Methods (Novyye pribori i metody izme-
reniy) **Practical Spectral Instruments** (Real'nyye spektral'nyye
pribory)

PERIODICAL:

Uspekhi fizicheskikh nauk, 1958, Vol 66, Nr 3, pp 475-517(USSR)

ABSTRACT:

The author of this paper gives a survey of the theory of the practi-
cal spectral analysis in contrast to the "ideal", "artificial"
or "**distorted**" (iskazheniya as the author calls it in the
following) spectral analysis, such as is obtained by a
Fourier (Fur'ye) analysis of the radiation investigated. First,
the author divides the factors varying the real spectrum
into two groups (macro- and microstructural influence) which
he discusses. Further, the qualitative modifications by means
of factors of the second group are discussed, and their in-
fluence upon the representation of the spectral energy dis-
tribution is investigated. For the distribution function
 $f(x')$ observed, the following formula (1) is given:

Card 1/4

New Devices and Measuring Methods.
 Practical Spectral Instruments

SOV/53-66-3-4/7

$$f(x') = \int_{-\infty}^{\infty} a(x'-x) \varphi(x) dx \quad (\text{for the graphical representation}$$

of the curves cf. figure 1). This formula takes variations both in the optical and in the recording parts of the device into account. (1) connects the artificial quantities as well as those observed by means of a real device not only in the case of spectroscopical but also of other physical measurements. Several fields of application for (1) are discussed. Furthermore, the apparatus function is dealt with and a formula is given for the objective aperture diffraction (Refs 29-30):

$$a(x) = \frac{1}{s_0} \left[\frac{\sin \pi x/s}{\pi x/s_0} \right]^2$$

where $s_0 = \lambda f/D$. This function is subjected to a Fourier's analysis. In the following, apparatus functions of various forms are investigated and Fourier transformations are given. Figure 2 shows the course taken by various functions, and

Card 2/4

New Devices and Measuring Methods.
Practical Spectral Instruments

SOV/53-66-3-4/7

Figure 3 shows the corresponding Fourier transformations of these curves. Further, the variation factors of a third group (measurements of errors) are dealt with by means of the equation corresponding to (1):

$$f(x) = \int_{-\infty}^{\infty} a(x-x') \varphi(x') dx' + \xi(x) \quad (27).$$

In paragraph 2 of the paper the case of absolutely accurate measurement is dealt with on the basis of the function (1) and (27). Investigation is based upon the following question: If real distribution consists of two monochromatic lines the distance between which is d , i.e. that

$$\varphi(x) = \frac{1}{2} \left[\delta(x-x_0 - \frac{d}{2}) + \delta(x-x_0 + \frac{d}{2}) \right] \text{ holds, at what } d\text{-value}$$

can the two lines still be recorded separately in $x = x_0$ in the case of a minimum of intensity? The problems of resolving power and of the minimum resolvable wave length interval

Card 3/4

New Devices and Measuring Methods.
Practical Spectral Instruments

SOV/53-66-3-4/7

are discussed. Reduction methods are discussed and approximation methods are given; several special cases of reductions to the ideal case are discussed, among others the case of an interference spectroscopy (Fabry-Perot-standard) (Ref 104). The third paragraph deals with the uniqueness and accuracy of reduction to the ideal case of an apparatus. Again proceeding from (1), the limiting case of an absolutely accurate measurement is dealt with and the uniqueness of possible reduction is investigated. Paragraph 4 finally deals with the problem of resolution. Criteria for resolution are compiled in form of a table for various device functions. There are 9 figures, 1 table, and 130 references, 62 of which are Soviet.

Card 4/4

SOV/51-6-1-9/30

AUTHORS: Sokolovskaya, A.I. and Rautian, S.G.

TITLE: The Effect of the Refractive Index of the Scattering Medium on the Intensity of Line σ_2 Raman Scattering of Light (Vliyaniye pokazatelya prelomleniya rasseivayushchey sredy na intensivnost' liniy kombinatsionnogo rasseyaniya sveta)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 1, pp 51-54 (USSR)

ABSTRACT: Several workers have already pointed out the necessity of allowing for the refractive index of the scattering liquid in measurements of the Raman line intensities (Reis 1-3). There are four effects due to the refractive index of the scattering liquid which may affect the Raman line intensities: (1) change of the reflection coefficient at the boundary liquid-glass (of the cell); (2) change of the configuration of rays of exciting light inside the cell; (3) change of the brightness of scattered radiation on leaving the cell; (4) change of the conditions of formation of the image of the cell at the spectrograph slit. The author experimented with a double-walled glass tube (Fig 1) filling the space between the walls with air, alcohol, benzene, toluene and CS₂. The inner tube was filled with a liquid in which the Raman scattering occurred. Variations of the reflection coefficient at the

Card 1/2

SOV/51-6-1-9/30
The Effect of the Refractive Index of the Scattering Medium on the Intensity of
Lines of Raman Scattering of Light

tube wall due to the use of various outer jackets of liquids were found to have only a negligible effect on the Raman line intensities (Fig 2 gives the dependence of the exciting light intensity on the refractive index of the substance in the space between the tube walls). This experiment disposed of the effect (1). The author proved the effects (2) and (4) to be also negligible by using two widely differing sources of light. The Raman lines were hardly affected, as shown by Fig 3, where the same straight line represents the temperature dependence of the 656 cm line intensity in CS_2 when two different sources of light were used. Thus only the effect (3) remains and it has to be allowed for, since the change in the intensity of the Raman scattered radiation is proportional to n_1^2 , where n_1 is the refractive index of the scattering liquid. The author thanks P.A. Bazhulin for his advice. There are 3 figures and 10 references, 5 of which are Soviet and 5 English.

SUBMITTED: March 27, 1958

Card 2/2

24(4)

SOV/51-0-4-23/29

AUTHORS: Malyshev, V.I. and Rautian, S.G.

TITLE: Use of Echelettes at Large Angles of Diffraction (Ispol'zovaniye esheletta pri bol'shikh uglakh difraktsii)

PERIODICAL: Optika i Spektroskopiya, 1969, Vol 6, Nr 4, pp 550-555 (USSR)

ABSTRACT: Echelettes are normally used at small angles of diffraction ψ , since otherwise the intensity of the main maxima are very small. Echelette grooves have a non-symmetrical triangular form shown in Fig 1. The main maxima are strongest when specular reflection from the groove sides is employed (two "blaze" angles ψ_1 and ψ_2 , shown in Fig 1). Normally the ψ_1 angle is used corresponding to reflection from the wider side of the groove. The angle ψ_1 varies between 10 and 25°. On first sight the use of the second "blaze" angle ψ_2 seems to be inconvenient because the transverse section of the beam $A\psi_2$ is much smaller than $A\psi_1$. A detailed analysis of the question, however, shows that the use of the angle ψ_2 has certain advantages. The authors discuss the use of an echelette grating in conjunction with a monochromator. Advantages of the "blaze" angle ψ_2 are dealt with theoretically and the theory is confirmed by experiments. For these experiments the authors used a

Card 1/2

SOV/51-6-4-23/29

Use of Echelettes at Large Angles of Diffraction

double-beam diffraction infrared spectrophotometer DAIKS-F1 constructed in the Optical Laboratory of FIAN (with the help of A.M. Surov). The main monochromator is assembled using the scheme described by Ebert and Fastie (Refs 5, 6). Preliminary monochromatization was produced by an instrument using LiF or KBr prisms. The complete assembly is shown in Fig 2. The grating used was an echelette GOI number 2538 with 300 lines/mm and a "blaze" angle of 18° . To check the theoretical conclusions the rotational structure of a methane band was recorded in the region 1.7μ . Similar measurements were made on mercury lines at $1.35, 1.39, 1.53$ and 1.71μ . In all cases good agreement between theory and experiment was obtained. It was found that on using the echelette grating with the "blaze" angle ϕ_2 the resolving power of the apparatus could be doubled. Furthermore, the echelette could then be used in a wider range of wavelengths. The experiments carried out showed that the echelettes prepared by F.M. Gerasimov at GOI were of sufficiently high quality for their second "blaze" angle to be used. There are 3 figures and 14 references, 7 of which are Soviet, 6 English and 1 German.

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Card 2/2

SO. 51-7-4-22/32

AUTHOR: Rautian, S.G.

TITLE: On the Echelette Theory

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 4, pp 564-566 (USSR)

ABSTRACT: Only a small amount of work has been done so far on the distribution of energy in the diffraction orders produced by a grating. Two difficulties appear here. Firstly the grating constant is of the order of light wavelengths and consequently the distribution calculated according to Kirchhoff may be seriously in error. Secondly the neighbouring grooves may screen the incident and diffracted waves. The present note deals with double reflection inside a groove, which is one of such screening effects. The author discusses the special case of a triangular groove with 90° between the groove faces (Fig 1). It is assumed that a plane wave falls on the grating; the wave vector lies in the principal plane of the grating and makes an angle ψ with the normal to the grating and only the region $-\pi/2 + \delta \leq \psi \leq \delta$ is considered, where δ is the angle between the plane of the grating and the larger face of the groove. Some of the rays are reflected from one of the faces but miss the other face (for example ray 1). Other rays are reflected from both faces and return along the same path as the incident ray (rays 2 and 2'). Simple

Card 1/2

On the Echelette Theory

SOV/51-7-4-22/32

calculations lead to physico-optical formulae for the grating reflection coefficient k_r . Fig 2 shows the values of the reflection coefficient calculated using these formulae for various orders m of the line $\lambda = 5791 \text{ \AA}$ when the grating constant is $d = 1/300 \text{ mm}$ and $\beta = 180^\circ$. Allowance for double reflection inside the grating grooves leads to a large number of intense orders with negative m (Fig 2). This theoretical conclusion is valid for slightly deformed groove faces and when the angle between the faces is other than 90° . Fig 3 shows measured reflection coefficients of GOI (State Optical Institute) gratings with 600 lines/mm ($\lambda = 5461 \text{ \AA}$, $\beta = 17^\circ$, see Fig 3a) and 300 lines/mm ($\lambda = 5461 \text{ \AA}$ and $\beta = 32.7^\circ$, see Fig 3b). The agreement between the experimental (Fig 3) and the theoretical (Fig 2) distributions is good. It follows that the large number of intense negative orders, reported by many spectroscopists, is due to double reflection inside grating grooves. Double reflection leads to an increase of the reflection coefficient k_r at large angles of diffraction. This makes it possible to use the high resolving power of gratings at large values of β (Ref 9). There are 3 figures and 9 references, 4 of which are Soviet, 4 English and 1 translation.

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Card 2/2

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AUTHORS:

Malyshev, V. I., Rautian, S. G.

TITLE:

A Vacuum Double-beam Diffraction Spectrophotometer for the Infrared Range

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 10, pp 1237-1239 (USSR)

ABSTRACT:

At the Opticheskaya laboratoriya im. G. S. Landsberga FIAN (Optical Laboratory imeni G. S. Landsberg of the FIAN) a spectrophotometer with high resolving power was constructed, which is described. The device consists of three main parts: The double beam condenser with the photometrical recording- and amplifying systems, the premonochromator, and the diffraction monochromator. The optical scheme of the entire device is shown by figure 1 and is discussed in detail. The condenser consists of a system of spherical ($f=180$ and 200 mm) and plane mirrors; the premonochromator consists of a spherical ($f=300$ mm) and two plane mirrors and LiF- or KBr-prisms; the diffraction monochromator consists of two spherical mirrors with $f=2000$ mm, one with $f=50$ mm, the grating, a plane mirror, and two KBr-lenses ($f=540$ and 700 mm). A reducer makes it possible to adjust the instrument to 11 different rotational speeds (from $5 \cdot 10^{-4}$ to

Card 1/2

SOV/48-23-10-25/39

A Vacuum Double-beam Diffraction Spectrophotometer for the Infrared Range

$5 \cdot 10^{-7}$ rad.sec⁻¹), the swing range is 20°. Figure 2 shows an absorption spectrum recorded by means of this instrument (CO at 4.56 μ). The entire device weighs about one ton. The vacuum of 10^{-1} - 10^{-2} torr is maintained by means of a pump of the type VN-2. The spectral width of the slit within the range of 1.5-5 μ is 0.2-0.25 cm⁻¹. There are 2 figures and 5 references, 4 of which are Soviet.

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Card 2/2