NBS SPECIAL PUBLICATION 393

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

Colorimetry and Spectrophotometry: A Bibliography of NBS Publications January 1906 Through January 1973

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards[1] was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau consists of the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, the Institute for Computer Sciences and Technology, and the Office for Information Programs.

THE INSTITUTE FOR BASIC STANDARDS provides the central basis within the United States of a complete and consistent system of physical measurement; coordinates that system with measurement systems of other nations; and furnishes essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce. The Institute consists of a Center for Radiation Research, an Office of Measurement Services and the following divisions:

Applied Mathematics — Electricity — Mechanics — Heat — Optical Physics — Nuclear Sciences[2] — Applied Radiation[2] — Quantum Electronics[3] — Electromagnetics[3] — Time and Frequency[3] — Laboratory Astrophysics[3] — Cryogenics[3].

THE INSTITUTE FOR MATERIALS RESEARCH conducts materials research leading to improved methods of measurement, standards, and data on the properties of well-characterized materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; and develops, produces, and distributes standard reference materials. The Institute consists of the Office of Standard Reference Materials and the following divisions:

Analytical Chemistry — Polymers — Metallurgy — Inorganic Materials — Reactor Radiation — Physical Chemistry.

THE INSTITUTE FOR APPLIED TECHNOLOGY provides technical services to promote the use of available technology and to facilitate technological innovation in industry and Government; cooperates with public and private organizations leading to the development of technological standards (including mandatory safety standards), codes and methods of test; and provides technical advice and services to Government agencies upon request. The Institute consists of a Center for Building Technology and the following divisions and offices:

Engineering and Product Standards — Weights and Measures — Invention and Innovation — Product Evaluation Technology — Electronic Technology — Technical Analysis — Measurement Engineering — Structures, Materials, and Life Safety[4] — Building Environment[4] — Technical Evaluation and Application[4] — Fire Technology.

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides technical services designed to aid Government agencies in improving cost effectiveness in the conduct of their programs through the selection, acquisition, and effective utilization of automatic data processing equipment; and serves as the principal focus within the executive branch for the development of Federal standards for automatic data processing equipment, techniques, and computer languages. The Institute consists of the following divisions:

Computer Services — Systems and Software — Computer Systems Engineering — Information Technology.

THE OFFICE FOR INFORMATION PROGRAMS promotes optimum dissemination and accessibility of scientific information generated within NBS and other agencies of the Federal Government; promotes the development of the National Standard Reference Data System and a system of information analysis centers dealing with the broader aspects of the National Measurement System; provides appropriate services to ensure that the NBS staff has optimum accessibility to the scientific information of the world. The Office consists of the following organizational units:

Office of Standard Reference Data — Office of Information Activities — Office of Technical Publications — Library — Office of International Relations.

---

[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.
[2] Part of the Center for Radiation Research.
[3] Located at Boulder, Colorado 80302.
[4] Part of the Center for Building Technology.

Colorimetry and Spectrophotometry: A Bibliography of NBS Publications January 1906 Through January 1973

Kenneth L. Kelly

Building Environment Division
Center for Building Technology
Institute for Applied Technology
U.S. National Bureau of Standards
Washington, D.C. 20234

U.S. DEPARTMENT OF COMMERCE, Frederick B. Dent, *Secretary*
NATIONAL BUREAU OF STANDARDS, Richard W. Roberts, *Director*

Issued April 1974

Library of Congress Cataloging in Publication Data

Kelly, Kenneth Low, 1910-
Colorimetry and spectrophotometry: a bibliography of NBS publications, January 1906 through January 1973.

(NBS special publication 393)
Supt. of Docs. no.: C 13.10: 393.
1. Colorimetry--Bibliography. 2. Spectrophotometry--Bibliography. I. United States. National Bureau of Standards. II. Title. III. Series: United States. National Bureau of Standards. Special publication 393.
QC100.U57 no. 393 [Z7144.C7] 389'.08s [016.543'085]
74-5090

National Bureau of Standards Special Publication 393

Nat. Bur. Stand. (U.S.), Spec. Publ. 393, 54 pages (Apr. 1974)

CODEN: XNBSAV

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1974

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
(Order by SD Catalog No. C13.10:393). Price 95 cents.

COLORIMETRY AND SPECTROPHOTOMETRY: A BIBLIOGRAPHY OF NBS PUBLICATIONS JANUARY 1906 THROUGH JANUARY 1973

Kenneth L. Kelly

This bibliography of publications will serve as the key to the large amount of research into color measurement and specification, and color vision carried out by the staff of the National Bureau of Standards (NBS) in colorimetry and spectrophotometry. These 623 publications appeared in NBS publications and outside scientific and technical journals between January 1906 and January 1973. This material has been in constant demand by Bureau members as well as by outside individuals and organizations. The practical value of this wealth of information lies in its ready accessibility to the scientific and technical fraternity by title, by key words or by author, in the Library of Congress and in depository libraries such as large public and university libraries. A short organizational chronology of the colorimetry and spectrophotometry program is included.

Key Words: Bibliography; color; color codes; color measurement; colorimetry; spectrophotometry; vision.

1. INTRODUCTION

This paper lists the 623 publications on colorimetry[1] and spectrophotometry[2] authored by members of the staff of the National Bureau of Standards published during the years 1906 to 1973. (There were no relevant papers between 1901, the year the Bureau was founded, and 1906). This listing, made necessary by the constant demand for this information, also contains the publications of Research Associates and Guest Workers in these fields. In addition to the chronological list[3], it contains an Author[4] and a Subject Index[5]. The reference numbers appearing in these indexes refer to the entries in the chronological listing. A short organizational chronology of the colorimetry and spectrophotometry program is included.

2. HISTORY

Soon after the founding of the Bureau of Standards in 1901[6], studies in photometry and colorimetry were undertaken by members of the staff at the request of business, science and industry. The results of these studies appeared as papers in the Bulletin of the Bureau of Standards and in other scientific and technical journals. Among the projects undertaken in these formative years were those in the fields of length, electricity, spectroscopy, fibers

---

[1] Colorimetry - the study of color measurement, specification, designation, tolerances, blindness, color-order systems, vision.

[2] Spectrophotometry - the spectral measurement of reflecting or transmitting samples, including reduction of the data.

[3] See Sections 9.

[4] See Section 11.

[5] See Section 10.

[6] Name changed from Bureau of Standards (BS) to the National Bureau of Standards (NBS) in 1934.

and clinical thermometers in addition to the work in photometry and colorimetry. The challenges to these "pioneers" were tremendous as shown by the diversity of fields studied by so few men. Standardization of colors was the field of research which attracted the most interest and concern in industry as well as in the scientific community [1][7]. Requests for assistance in color measurement and standardization were received from the fields of cottonseed oil, margarine, butter, from glass (in signal lamps, headlights and spectacles for eye protection), to petroleum oil, turpentine, rosin, paper and textiles, from flour, sugar, eggshells, egg yolks, dyes and water to chemical solutions, paints, portland cement, tobacco, to porcelain, enamels and even blood and human skin -- the latter of concern to biologists and anthropologists.

The list of authors of these papers reads like an early Who's Who in Science. Some of these men later rose through the ranks at the Bureau, while others went to scientific or industrial organizations where they carried on the high-level and imaginative research which characterized their early developmental years at the Bureau. Many of the early papers listed in this report formed the cornerstones of all photometry and colorimetry, such as the one on the standard visibility curve [2] by Gibson (1916)[8] and Tyndall (1919)[8], and the paper defining the International Commission on Illumination (ICI) (now Commission Internationale de l'Éclairage (CIE)) Standard Observer and Coordinate System [3] by Judd (1927)[8].

It can be seen from the chronological listing that the early colorimetry work was carried on by Hyde (1902)[8], Nutting (1903)[8] and Ives (1908)[8]; Nutting was in charge in 1911. In 1913 Mr. Irwin G. Priest (1907)[8] was Chief of the Section on Colorimetry in the Optics Division, and he continued in that capacity until his death in 1932, when he was followed as Chief by Dr. K. S. Gibson. In 1948 the Optics Division was merged with the Electricity Division to form the Division of Electricity and Optics, and by reorganization the Division of Optics and Metrology in 1950. In 1955, on Dr. Gibson's retirement, Mr. L. E. Barbrow became Chief of the Photometry and Colorimetry Section which in 1960 became part of the Metrology Division. In 1966 the Colorimetry and Spectrophotometry Section was reformed with Mr. I. Nimeroff as Chief. When the Metrology Division was combined with the Division of Atomic and Molecular Physics in 1969, the colorimetry program was transferred into the Institute for Applied Technology and designated as the Office of Colorimetry. The Spectrophotometry part of the old Colorimetry and Spectrophotometry Section became the Spectrophotometry Section of the new Optical Physics Division. Most of the Office of Colorimetry was transferred in 1970 to the Applied Acoustics and Illumination Section of the Building Research Division[9]. Now the colorimetry program is in the Sensory Environment Section of the Building Environment Division. Dr. Judd, one of the world authorities on color, remained with the colorimetry program until his death in 1972, although assigned as consultant to the Director of the Institute for Applied Technology. Despite the organizational changes identified above, significant work continued on color standards, tolerances, measurement, specification and color vision.

These changes reflect new demands from rapidly expanding fields of research. Among these, for instance, are challenging new problems arising from the fast growing fields of aerospace (heat balance between solar radiation and cold in space craft), color standards and tolerances (specify color and acceptable variation in purchase specifications) and safety (one safety color code for marking physical hazards and highway traffic signs, adapted to help color blind).

3. CONTRIBUTIONS FROM PRIVATE INDUSTRY

A considerable source of inspiration and support to the Colorimetry Section in its early days came from Mr. A. H. Munsell, a noted artist from Boston. Mr. Munsell realized that there was no practical and scientific method of teaching color either in art schools or in the grade schools where most students get their first color instruction. He worked toward the realization of "a simple and practical notation, or method of writing (designating)

---

[7]Figures in brackets [] indicate the literature references in the Bibliography (Section 8).

[8]Year each joined the Bureau of Standards.

[9]Now the Center for Building Technology.

color" [4] by the use of a system that "portrays the three dimensions (hue, value or lightness and chroma or saturation) of color, and measures each by an appropriate scale" [5], each scale to consist of colored samples separated by visually equal steps. The clarifying phrases in parentheses are the author's.

Mr. Munsell's first contact with the Bureau of Standards was in 1901, just after the formation of the Bureau when he wrote Dr. Stratton, the Director, "asking about color" [6]. He visited the Bureau in 1911 where he met Dr. P. G. Nutting who was in charge of the work that included colorimetry. Mr. Munsell's son, Mr. A.E.O. Munsell, met Mr. Priest in 1921 and from this meeting a very close relationship developed from which the Colorimetry and Spectrophotometry Section has benefited materially throughout the years. An indication of the degree of cooperation, is the fact that the Munsell Color Company has placed seven Research Associates at the Bureau. By 1940, 23 papers covering this work had been presented to the Optical Society of America [7]. In addition, a good deal of unpublished work was performed which contributed "to the development of basic information necessary, if (the) Munsell (color-order system), or any other color system was to be critically studied or standardized" [8].

This work funded by the Munsell Research Laboratory was conducted both at NBS and at the Munsell Research Laboratory in Baltimore. In addition to the regular Munsell Color Company staff, seven persons were employed at one time or another in the strictly scientific work at the Baltimore Laboratory. These were: Miriam O'Brian, Louise Sloan (Rowland), Geraldine Walker (Haupt), employed by NBS in 1927, I. H. Godlove, Carl Boechner, Prentice Reeves and Willard Valentine. The seven Research Associates placed at NBS were: Casper L. Cottrell, I. G. Priest, D. B. Judd, F. H. Harris (retired later as Section Chief in the Electricity Division), F. G. Brickwedde (retired later as Division Chief of the Heat and Power Division), E.P.T. Tyndall and W. Greenberg.

A significant contribution of the Colorimetry and Spectrophotometry Section to the designation of color in art, science and industry came through research funded by the American Pharmaceutical Association. This work led to a simple, easily understood and accurately defined method of designating colors "in which the color-name boundaries were specified in Munsell notation" [9]. It also provided the impetus for many of the papers listed here, culminating with the Color Names Dictionary (NBS Circular 553) [10] published by the Inter-Society Color Council (ISCC) and the National Bureau of Standards (NBS) in 1955, the ISCC-NBS Centroid Color Charts (NBS Standard Sample #2106) [11] in 1965 and the Universal Color Language [12] in 1965. In addition, this research played a vital role in the formation of the Inter-Society Color Council (ISCC)[10] in 1931 and the Color Marketing Group (CMG)[11] in 1962.

The close cooperation between NBS and the Munsell Color Company has continued through the years. This has resulted in such landmark developments as the Munsell Renotation System in 1943, in which the spacings in the three scales of hue, value (lightness) and chroma (saturation) were smoothed and each color was specified in the 1931 CIE system, and facilitated Munsell's significant contribution to the development of the ISCC-NBS Centroid Colors in 1965. The Munsell Color Company in 1967 funded a cooperative study to develop an improved, visually uniform, color spacing technique based on the work of the Optical Society of America (OSA) Committee on Uniform Color Scales (1966).

---

[10] The founding of the Inter-Society Color Council was a direct outgrowth of the early work on the color-names project. It exists as a medium for interchange of information and development of basic concepts on color-related problems.

[11] The Color Marketing Group was a direct outgrowth of the ISCC. Its purpose is the use of color to better market products and services at a profit.

In 1942, the Munsell Color Foundation was formed at the request of the members of the Munsell family. Two of the duties of this non-profit Foundation were to hold the stock of and assume the direction of the Munsell Color Company. A further indication of the continuing close cooperation between NBS and the Munsell Color Company was a stipulation in the formation of the Foundation, that one of the three original Trustees was to be appointed by the Director of NBS. Dr. Judd was so appointed, and was elected President of the Foundation by the other Trustees. He served as President without remuneration from its formation in 1942 until his death in 1972.

Many scientific and technical associations and companies have contributed to the work of the Colorimetry and Spectrophotometry Section, and in so doing, have benefited in return. The Corning Glass Works, for instance, through their Dr. H. P. Gage cooperated with our Dr. K. S. Gibson between 1926 and 1946 in the development and application of colored glass filters to be used as the color standards in railway signaling in this country. Before the development of spectrophotometry and the 1931 CIE Standard Observer and coordinate System [3] as the means of interpreting spectrophotometric data, standard limit glasses were used to control the range of color acceptable for a particular signal application. So successful was this system that it served as the basis of the signaling systems used later for the control of vehicular, marine and aircraft traffic. Only now is this system of colored glass standards being slowly supplanted by photoelectric colorimetry and spectroradiometry, a method by which the color of the whole signal device consisting of a lamp or kerosene flame, reflector and colored lens, can be measured in operating position.

4. IMPACT OF PUBLICATIONS

The papers listed here have had a considerable influence on the development and application of color in science, art and industry. The chronological listing including the Author and Subject Indexes is almost synonymous with the basic work in vision in the first three quarters of the 20th century. Researchers like Nutting, Tyndall, Priest, Gibson, Judd and Hunter (1927)[8] are among those who contributed greatly to the fields of vision as well as color. Judd's basic book on Color in Business, Science and Industry in its two editions, has been "the" textbook in color psychophysics[12] since its publication in 1952. Subjects like the visibility of radiant energy (now the luminous efficiency function), photometry of lamps, color vision, color blindness, color-order systems, the CIE Standard Observer and Coordinate System, spectrophotometry, color measurement and specification, safety color codes, gloss and other surface characteristics, color temperature, color standards and tolerances constitute only a partial listing of the contributions made by NBS to the development and application of color in commerce and industry.

5. COOPERATION WITH OUTSIDE ORGANIZATIONS

Throughout the years, the members of the Colorimetry and Spectrophotometry Section have contributed to and held positions of leadership in many scientific and technical organizations. In several they have been charter members. Among these are:

American Association for the Advancement of Science
American Ceramic Society
American Institute of Physics
American Instrument Society
American Medical Association
American Oil Chemists Society
American Pharmaceutical Association
American Physical Society
Astronomical Society
Association of Physics Teachers
Color Marketing Group
Illuminating Engineering Research Institute

[12] Color Psychophysics is the study and application of psychophysical methods to the investigation and measurement of color.

Institute of Electrical Engineers
International Color Association
International Commission on Illumination
Inter-Society Color Council
London Illuminating Engineering Society
Munsell Color Foundation
Optical Society of America
Physical Society of London
Societie Francaise de Physique
Union of Geodesy and Geophysics
Washington Academy of Medicine
Washington Academy of Sciences

The members have also contributed to and held positions in a number of standardizing organizations, such as:

American Association of Textile Chemists and Colorists
American National Standards Institute (first the American Engineering Standards Committee, then the American Standards Association, then the United States of America Standards Institute)
American Society for Testing and Materials
Association of American Railroads
Electronic Industries Association
Illuminating Engineering Society
Institute of Traffic Engineers
International Standards Organization
National Education Association
National Joint Committee on Uniform Traffic Control Devices for Streets and Highways
Technical Association of the Pulp and Paper Industry
Textile Color Card Association (now the Color Association of the United States)

They have also worked closely with and contributed to programs dealing with color in a number of government agencies including:

Department of Agriculture
Department of Defense
Department of Transportation
Federal Aviation Administration
Federal Communications Commission
General Services Administration
National Academy of Sciences
National Research Council
Occupational Safety and Health Administration
Post Office Department
Veterans Administration

Another important contribution of the Colorimetry and Spectrophotometry Section throughout its more than a half-century of existence, has been the sharing of its expertise with those non-professionals as well as specialists seeking information on color and vision. Letters of inquiry and requests for assistance have come from all parts of the United States and cover a wide range of subjects. An indication of the diversity of the requests is provided by the following examples:

Tell me all about color
What colors were the circle and dot of the insignia on the allied planes in World War I?
What color is 31643?
Detailed requests about color vision
Requests for assistance in developing color standards and tolerances for the Federal Government or for industry
Requests for color assistance in books on photogrammetry, flowers, oceanography, mushrooms

Mortuary cosmetics
Skin colors

6. THE NUMBERING SYSTEM

The individual papers in this list have been arranged according to the year and month of publication. As stated earlier, each paper has been assigned a serial number starting with 1. These numbers are also used to reference individual papers under specific headings and under authors' names in the Author Index and in the Subject Index.

Each reference includes besides the chronological serial number, the author's name(s), the title of the paper or abstract, the abbreviation of the journal or publication in which it appears, the volume number underscored, the beginning page number and the year of publication in parentheses. If the paper is published in more than one journal, subsequent references follow the first and are separated by semicolons.

7. IN APPRECIATION

It is a pleasure to acknowledge the contributions of each of the members of the Colorimetry and Spectrophotometry Section, especially Dr. Deane B. Judd who sponsored this project, and who, with his very broad knowledge and experience, was a constant source of inspiration and guidance.

8. BIBLIOGRAPHY

1. Cochrane, Rexmond C., Measures for Progress, A History of the National Bureau of Standards, page 270. Superintendent of Documents, U.S. Gov't. Printing Office, Washington, D.C. 20402.

2. Gibson, K. S. and Tyndall, E.P.T. See item 90 in Section 9.

3. Judd, Deane B., See item 221 in Section 9.

4. Nickerson, Dorothy, History of the Munsell Color System, Color Engineering 7, 42 (Sept.-Oct. 1969).

5. Ibid, p. 42.

6. Nickerson, Dorothy, History of the Munsell Color System and Its Scientific Application, J. Opt. Soc. Amer. 30, 576 (1940).

7. See 4 above, p. 46.

8. Ibid, p. 47.

9. Ibid, p. 49; also see 6 above, p. 585.

10. Kelly, K. L. and Judd, D. B., See item 465a in Section 9.

11. See item 517a in Section 9.

12. Kelly, Kenneth L., see item 518 in Section 9.

9. CHRONOLOGICAL LIST OF PUBLICATIONS

1. Hyde, Edward P.
Talbot's law as applied to the rotating sectored disk.
Bull. Bur. Stand. 2, 1 (1906) S26.

2. Nutting, P. G.
A pocket spectrophotometer.
Bull. Bur. Stand. 2, 317 (1906) S39.

3. Nutting, P. G.
Purity and intensity of monochromatic light source.
Sci. Pap. Bur. Stand. 2, 439 (1907) S44.

4. Nutting, P. G.
The complete form of Fechner's law.
Bull. Bur. Stand. 3, 59 (1907) S49.

5. Nutting, P. G.
The luminous equivalent of radiation.
Sci. Pap. Bur. Stand. 5, 261 (1908) S103.

6. Nutting, P. G.
A method for constructing the natural scale of pure color.
Bull. Bur. Stand. 6, 89 (1909-10) S118.

7. Nutting, P. G.
Luminosity and temperature.
Bull. Bur. Stand. 6, 337 (1909-10) S103.

8. Ives, Herbert E.
Daylight efficiency of artificial illuminants.
Bull. Bur. Stand. 6, 231 (1909-10) S125.

9. Ives, Herbert E.
White light from the mercury arc and its complementary.
Bull. Bur. Stand. 6, 265 (1909-10) S128.

10. Nutting, P. G.
The visibility of radiation. A recalculation of Koenig's data.
Bull. Bur. Stand. 7, 235 (1911) S154.

11. Nutting, P. G.
A photometric attachment for spectroscopes.
Bull. Bur. Stand. 7, 239 (1911) S155.

12. Nutting, P. G.
A new precision colorimeter.
Bull. Bur. Stand. 9, 1 (1913) S187.

13. Priest, Irwin G.
Color specifications.
Rep. Proc. Fourth Ann. Meet. Soc. Cotton Products Analysts (now the Amer. Oil Chem. Soc.), p. 6, June 21, 1913.

14. Priest, Irwin G.
A photometric error sometimes accompanying the use of a pair of nicols, and a proposal for its elimination.
J. Wash. Acad. Sci. 3, 298 (1913).

15. Coblentz, W. W.
The diffuse reflecting power of various substances.
Bull. Bur. Stand. 9, 283 (1913) S196.

16. Priest, Irwin G.
The quartz colorimeter and its applicability to the color grading of cotton seed oil.
Rep. Proc. Fifth Ann. Meet. Soc. Cotton Products Analysts (now Amer. Oil Chem. Soc.) p. 21, May 16, 1914.

17. Priest, Irwin G.
A proposed method for the photometry of lights of different colors.
Phys. Rev. (2), 6, 64 (1915); 9, 341 (1917); 10, 208 (1917).

18. Priest, Irwin G.
The Bureau of Standards contrast method for measuring transparency.
Trans. Amer. Ceram. Soc. 17, 150 (1915).

19. Priest, Irwin G. and Peters, Chauncey G.
Report on investigations concerning the color and spectral transmission of cotton seed oil.
Report Proc. Sixth Ann. Conv. Soc. Cotton Products Analysts (now Amer. Oil Chem. Soc.), p. 67, May 14-15, 1915.

20. Priest, Irwin G.
A simple spectral colorimeter of the monochromatic type.
J. Wash. Acad. Sci. 6, 74 (1916).

21. Gibson, K. S.
The effect of temperature upon the coefficient of absorption of certain glasses of known composition.
Phys. Rev. N. S., 7, 194 (1916).

22. Middlekauf, G. W. and Skogland, J. F.
An interlaboratory photometric comparison of glass screens and of tungsten lamps, involving color differences.
Sci. Pap. Bur. Stand. 13, 287 (1916) S277.

23. Gibson, K. S.
The effect of temperature upon the absorption spectrum of a synthetic ruby.
Phys. Rev. N. S. 8, 38 (1916).

23a. Priest, I. G.
Specifications of the transparency of paper and tracing cloth.
BS Circ. No. 63 (May 1917).

24. Priest, Irwin G. and Peters, Chauncey G.
Measurement and specification of the physical factors which determine the saturation of certain tints of yellow.
Tech. Pap. Bur. Stand. No. 92 (1917) T92.

25. Howe, H. E. and Gibson, K. S.
The ultraviolet and visible absorption spectra of phenolphthalein, phenolsulphonphthalein and some halogen derivatives.
Phys. Rev. N.S. 10, 767 (1917).

26. Crittenden, E. C. and Richtmyer, F. K.
An "average eye" for heterochromatic photometry, a comparison of a flicker and an equality-of-brightness photometer.
Bull. Bur. Stand. 14, 87 (1918-19) S299.

27. Coblentz, W. W. and Emerson, W. B.
Relative sensibility of the average eye to light of different colors and some practical applications to radiation problems.
Bull. Bur. Stand. 14, 167 (1918-19) S303.

28. Coblentz, W. W. and Emerson, W. B.
Luminous radiation from black body and the mechanical equivalent of light.
Sci. Pap. Bur. Stand. 14, 255 (1917) S305.

29. Priest, Irwin G.
The work of the National Bureau of Standards on the establishment of color standards and methods of color specification.
Trans. Illum. Eng. Soc. 13, 38 (1918).

30. Priest, Irwin G.
Discussion of Troland's paper "Psychology of Color".
Trans. Illum. Eng. Soc. 13, 21 (1918).
With special reference to determination of standard of white light. Trans. Illum. Eng. Soc. 13, 74 (1918).

32. Priest, Irwin G.
A precision method for producing artificial daylight.
Phys. Rev. (2), 11, 502 (1918).

33. Priest, Irwin G.
The law of symmetry of the visibility function.
Phys. Rev. (2), 11, 498 (1918).

34. Coblentz, W. W., Emerson, W. B. and Long, M. B.
Spectroradiometric investigation of the transmission of various substances.
Bull. Bur. Stand. 14, 653 (1918-19) S325.

35. Gibson, K. S.
Photoelectric spectrophotometry by the null method.
Sci. Pap. Bur. Stand. 15, 325 (1919-1920) S349.

36. Priest, Irwin G.
A one-term pure exponential formula for the spectral distribution of radiant energy from a complete radiator.
J. Opt. Soc. Amer. 2-3, 18 (1919).

37. Coblentz, W. W. and Emerson, W. B.
Glasses for protecting the eyes from injurious radiations (3rd edition).
Tech. Pap. Bur. Stand. No. 93 (1919) T93.

38. Priest, Irwin G.
A new formula for the spectral distribution of energy from a complete radiator.
Phys. Rev. (2), 13, 314 (1919); 14, 191 (1919).

39. Gibson, K. S. and McNicholas, H. J.
The ultraviolet and visible transmission of eye-protective glasses.
Tech. Pap. Bur. Stand. No. 119 (1919) T119.

40. Priest, Irwin G. and Gibson, K. S.
Report on the applicability of ultraviolet rays to signaling.
Phys. Rev. (2), 14, 188 (1919).

41. Priest, Irwin G. and Tyndall, E.P.T.
Optical and photographic methods for the detection of invisible writing.
Phys. Rev. (2), 14, 188 (1919).

42. Priest, Irwin G.
A method for the color grading of red flares.
Phys. Rev. (2), 14, 264 (1919).

43. Priest, Irwin G., Meggers, W. F., McNicholas, H. J., Gibson, K. S. and Tyndall, E.P.T.
The spectral composition and color of certain high intensity searchlight arcs. (In cooperation with the Searchlight Investigation Section, Corps of Engineers, USA).
Phys. Rev. (2), 14, 184 (1919).

44. Gibson, K. S., Tyndall, E.P.T. and McNicholas, H. J., The spectral transmission of filters used to detect camouflage or improve visibility.
Phys. Rev. (2), 14, 261 (1919).

45. Priest, Irwin G.
The color of soya bean oil as compared with that of cottonseed oil.
Cotton Oil Press 3, No. 9, 37, (1919-20).

46. Priest, Irwin G.
Recommendations in regard to color grading of cottonseed Oil.
Cotton Oil Press 3, No. 3, 86 (1919-20).

47. Gibson, K. S., Tyndall, E.P.T. and McNicholas, H. J.
The ultra-violet and visible transmission of various colored glasses.
Tech. Pap. Bur. Stand. No. 148 (1920) T148.

48. Karrer, Enoch and Tyndall, E.P.T.
Contrast sensibility of the eye.
Sci. Pap. Bur. Stand. 15, 679 (1919-20) S366.

49. Priest, Irwin G.
Abstract of report on investigation of the color and spectral transmissivity of vegetable oils.
Cotton Oil Press 4, No. 3, 95 (1920-21). (Abstract).

50. Karrer, Enoch and Tyndall, E.P.T.
Relative spectral transmission of the atmosphere.
Sci. Pap. Bur. Stand. 16, 377 (1920) S389.

51. Priest, Irwin G., Meggers, W. F., Gibson, K. S., Tyndall, E.P.T. and McNicholas, H. J.
Color and spectral composition of certain high-intensity searchlight arcs.
Tech. Pap. Bur. Stand. No. 168 (1920) T168.

52. Priest, Irwin G., Gibson, K. S. and McNicholas, H. J.
An examination of the Munsell color system. I. Spectral and total reflection and the Munsell scale of value.
Tech. Pap. Bur. Stand. No. 167 (1920) T167.

53. Priest, Irwin G.
Note on the relation between the frequencies of complementary hues.
J. Opt. Soc. Amer. 4, 402 (1920); and 5, 513 (1921).

54. Priest, Irwin G.
Preliminary note on the relations between the quality of color and the spectral distribution of light in the stimulus.
J. Opt. Soc. Amer. 4, 389 (1920).

55. Priest, Irwin G. and Frehafer, M. K.
The optical basis of Bittinger's camouflage paintings.
J. Wash. Acad. Sci. 11, 238 (1921) (Abstract); J. Opt. Soc. Amer. 4, 390-395 (1920).

56. Gibson, K. S.
Infra-red absorption spectra of vegetable oils.
Cotton Oil Press 4, No. 5, 53 (1920-21).

57. Priest, Irwin G.
A new study of the leucoscope and its application to pyrometry.
J. Opt. Soc. Amer. 4, 448 (1920).

58. Priest, Irwin G.
The application of rotatory dispersion to colorimetry, photometry and pyrometry.
Phys. Rev. (2), 15, 538 (1920).

59. Priest, Irwin G.
Report on calibration of sixteen Lovibond red glasses of nominal value 7.6.
Cotton Oil Press 4, No. 9, 43 (1920-21).

60. Priest, Irwin G.
Statement to the color committee, American Oil Chemists' Society meeting at the National Bureau of Standards, Washington, July 30, 1920.
Cotton Oil Press 4, No. 6, 45 (1920-21).

61. Priest, Irwin G.
The spectral distribution of energy required to evoke the gray sensation.
J. Opt. Soc. Amer. 5, 205 (1921). (Abstract); Photogr. J. (Harrison & Sons, Ltd., London, Eng.), 61 (new series 45), 360 (1921); Sci. Pap. Bur. Stand. 17, 231 (1922) S417.

62. Priest, Irwin G.
A direct reading spectrophotometer for measuring the transmissivity of liquids.
Phys. Rev. (2), 18, 127 (1921) (Abstract).

63. Priest, Irwin G.
A method of obtaining radiant energy having the visible spectral distribution of a complete radiator at very high temperatures.
J. Opt. Soc. Amer. 5, 178 (1921).

64. Priest, Irwin G.
The complete scale of color temperature and its application to the color grading of daylight and artificial illuminants.
Phys. Rev. (2), 20, 93 (1922). (Abstract).

65. Coblentz, W. W.
Spectroradiometric investigation of the transmission of various substances, II.
Sci. Pap. Bur. Stand. 17, 267 (1922)
S418.

66. Lofton, R. E.
A measure of the color characteristics of white papers.
Tech. Pap. Bur. Stand. 17, 667 (1922-24)
T244.

68. Gibson, K. S., McNicholas, H. J., Tyndall, E.P.T. and Frehafer, M. K.
The spectral transmissive properties of dyes. I. Seven permitted food dyes, in the visible, ultra-violet, and near infrared. (With the cooperation of W. E. Mathewson, Bureau of Chemistry).
Sci. Pap. Bur. Stand. 18, 121 (1922-23)
S440.

69. Troland, L. T.
Chairman, Optical Society of America Committee on Colorimetry, Report for 1920-21.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 6, 527 (1922).

70. Priest, Irwin G.
Measurement of the color temperature of the more efficient artificial light sources by the method of rotatory dispersion.
Sci. Pap. Bur. Stand. 18, 221 (1922-23)
S443; J. Opt. Soc. Amer. and Rev. Sci. Instrum. 6, 410 (1922).

71. Priest, Irwin G.
Progress on the determination of normal gray light.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 72 (1923). (Abstract).

72. Priest, Irwin G. and Cottrell, Casper L.
The effect of various conditions upon the determination of the normal stimulu of gray.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 73 (1923). (Abstract).

73. Frehafer, M. Katherine.
New tables and graphs for facilitating the computations of spectral energy distribution by Planck's formula.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 74 (1923). (Abstract).

74. Priest, Irwin G.
Preliminary data on the color of day-light at Washington.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 78 (1923). (Abstract).

75. Priest, Irwin G.
Apparatus for the determination of hue sensibility (wave-length differences perceptible by difference in hue) and the visibility of radiant energy.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 99 (1923). (Abstract).

76. Danielson, R. R. and Frehafer, M. K.
The effect of some substitutes for tin oxide on the opacity of white enamels for sheet steel.
J. Amer. Ceram. Soc. 6, 634 (1923).

77. Schertz, F. M., The quantitative determination of carotin by means of the spectrophotometer and the colorimeter.
J. Agr. Res., U. S. Dept. Agr. 26, 383 (1923).

78. Gibson, K. S.
Direct-reading photoelectric measurement of spectral transmission.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 693 (1923).

79. Priest, Irwin G.
The colorimetry and photometry of day light and incandescent illuminants by the method of rotatory dispersion.
Trans. Illum. Eng. Soc. 18, 861 (1923); J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 1175 (1923).

80. Priest, Irwin G.
Review of Peddie's "Colour Vision".
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 7, 1251 (1923).

81. Gibson, K. S.
Spectrophotometry. Dict. of Applied Physics, edited by Sir Richard Glazebrook (MacMillan and Co., Ltd., London) 4, 737 (1923).

82. Priest, Irwin G., Gibson, K. S. and Munsell, A.E.O.
A comparison of experimental values of dominant wave-length and purity with their values computed from the spectral distribution of the stimulus.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 8, 28 (1924). (Abstract).

83. Priest, Irwin G.
Apparatus for the determination of color in terms of dominant wave length, purity and brightness.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 8, 173 (1924).

84. Priest, Irwin G., McNicholas, H. J. and Frehafer, M. Katherine.
Some tests of the precision and reliability of measurements of spectral transmission by the König-Martens spectrophotometers.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 8, 201 (1924).

85. Appel, W. D.
The elimination of variables in the dyeing method of testing dyes.
Amer. Dyest. Rep. 13, 507 (1924).

86. Appel, W. D. and Brode, W. R.
Spectrophotometric analysis applied to chromotrope 10B.
Ind. Eng. Chem. 16, 797 (1924).

87. Gibson, K. S.
Spectral characteristics of test solutions used in heterochromatic photometry.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 9, 113 (1924).

88. Tyndall, E.P.T. and Gibson, K. S.
Visibility of radiant energy equation.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 9, 403 (1924).

89. Priest, Irwin G.
The computation of colorimetric purity. (With the collaboration of L. B. Tuckerman, Herbert E. Ives and F. K. Harris).
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 9, 503 (1924).

90. Gibson, K. S. and Tyndall, E.P.T.
Visibility of radiant energy.
Sci. Pap. Bur. Stand. 19, 131 (1923-24) S475; Trans. Illum. Eng. Soc. 19, 176 (1924).

91. Gibson, K. S.
Some tests on the accuracy of measurement with the rotatory dispersion colorimetric photometer.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 11, 75 (1925).

92. Priest, Irwin G.
Gray skies and white snow.
J. Wash. Acad. Sci. 15, 306 (1925); J. Opt. Soc. Amer. and Rev. Sci. Instrum. 11, 133 (1925). (Abstract).

93. Gibson, K. S.
Chairman, Optical Society of America Progress Committee for 1922-23, Report on spectrophotometry.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 10, 169 (1925).

94. Priest, Irwin G., Gibson, K. S. and Munsell, A.E.O.
The specification of color in terms of dominant wave-length, purity and brightness.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 10, 291 (1925). (Abstract).

95. Frehafer, M. Katherine and Snow, Chester, L.
Tables and graphs for facilitating the computation of spectral energy distribution by Planck's formula.
Misc. Pub. Bur. Stand. No. 56 (1925) M56.

96. Schertz, F. M.
The quantitative determination of xanthophyll by means of the spectrophotometer and the colorimeter.
J. Agr. Res., U. S. Dept. Agr. 30, 253, (1925).

97. Lloyd, Morton C.
Traffic signals.
Proc. Int. Ass'n. Municipal Electricians, 30th Meeting, Detroit (Int. Ass'n Munic. Elec., West New York, New Jersey), p. 154 (1925).

98. Optical Society of America Progress Committee on Radiometry and Photometry, Report presented October 24, 1924.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 11, 357 (1925).

99. Gibson, K. S.
Spectral centroid relations for artificial daylight filters.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 11, 473, (1925).

100. Priest, Irwin G., Gibson, K. S. and Harris, F. K.
Measurements of illumination and color temperature at Washington during the solar eclipse, January 24, 1925.
Phys. Rev. (2) 25, 901 (1925). (Abstract).

101. Priest, Irwin G., Gibson, K. S. and Harris, F. K.
Determination of the time of a solar eclipse from measurements of relative illumination.
Phys. Rev. (2) 25, 902, (1925). (Abstract).

102. Burgess, George K.
United States Bureau of Standards eclipse observations.
Sci. Amer. 133, 170 (1925).

103. Brode, Wallace R.
The effects of solvents on the absorption spectrum of a simple azo dye.
J. Phys. Chem. 30, 56 (1926).

104. Bruce, H. D.
A photometric method for measuring the hiding power of paints.
Tech. Pap. Bur. Stand. 20, 173 (1925-26) T306.

105. Appel, W. D., Brode, W. R. and Welch, I. M.
Standardization of agalma black 10B.
Ind. Eng. Chem. 18, 627 (1926).

106. Brode, Wallace R.
The dissociation of potassium iodide and the absorption spectra of iodine and potassium iodide.
J. Amer. Chem. Soc. 48, 1877 (1926).

107. Brode, Wallace R.
The absorption spectra of benzene-azobenzene.
J. Amer. Chem. Soc. 48, 1984 (1926).

108. Gibson, K. S.
Spectral filters.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 267 (1926); Intern. Critical Tables (National Research Council, Washington, D.C.) 5, 271 (1929).

109. Howe, H. E.
The color temperature of gas-filled lamps as a function of time in service.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 304 (1926). (Abstract).

110. Gibson, K. S.
The production of radiant energy of uniform intensity over the visible spectrum.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 305 (1926). (Abstract).

111. Priest, Irwin G. and Brickwedde, F. G.
The minimum perceptible colorimetric purity as a function of dominant wave-length with sunlight as neutral standard.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 306 (1926). (Abstract).
These data have been presented in more detail in J. Opt. Soc. Amer. 22, 96 (1932), and 20, 262 (1930).

112. Priest, Irwin G.
An experiment bearing on the adoption of a standard neutral stimulus in colorimetry: the choice as between "sun" and "equal energy".
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 306 (1926). (Abstract).

113. Priest, Irwin G.
Blue sky and white snow.
J. Opt. Soc. Amer. and Rev. Sci. Instrum 13, 308 (1926). (Abstract).

114. Priest, Irwin G.
Standard artificial sunlight for colorimetric purposes.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 12, 479 (1926). (Abstract).

115. Gibson, K. S. and Harris, F. K.
A spectrophotometric analysis of the Lovibond color system.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 12, 481 (1926). (Abstract).

116. Jones, L. A.
Chairman, Optical Society of America Committee on unit of photographic intensity, Report.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 12, 567 (1926).

117. Priest, Irwin G.
The computation of colorimetric purity. II. Application of the purity formula to non-spectral colors.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 123 (1926).

118. Judd, Deane B.
The computation of colorimetric purity.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 133 (1926).

119. Bittinger, C.
Chairman, Optical Society of America Committee on color terminology questionnaire, Report.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 13, 43 (1926).

120. Gibson, K. S.
The relative visibility function.
Proc. of the Int. Comm. on Ill., 6th Meeting, Geneva, 1924 (University Press, Cambridge, Eng.) pp. 67 and 232 (1926).

121. Peters, H. H. and Phelps, F. P.
Color in the sugar industry. I. Color nomenclature in the sugar industry. II. Colorimetric classification of turbid sugar solutions.
Tech. Pap. Bur. Stand. 21, 261 (1926-7) T338.

122. Gibson, K. S., Harris, F. K. and Priest, Irwin G.
The Lovibond color system. I. A spectrophotometric analysis of the Lovibond glasses.
Sci. Pap. Bur. Stand. 22, 1 (1927-8) S547.

123. Davis, Raymond and Gibson, K. S.
Reproducible liquid filters for the production of "white light".
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 135 (1927). (Abstract).

124. Gibson, K. S.
A proposed method for the measurement of the relative visibility function.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 135 (1927). (Abstract).

125. Priest, Irwin G. and Gibson, K. S.
Apparatus for the determination of the visibility of energy and the fundamental scales of visual psychophysics.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 136 (1927). (Abstract).

126. Tyndall, E.P.T.
Sensibility to wavelength difference as a function of purity.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 137 (1927). (Abstract).

127. Priest, Irwin G. and Judd, Deane B.
Sensibility to wavelength difference and the precision of measurement of dominant wavelength for yellow colors of high saturation.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 137 (1927). (Abstract).

128. Priest, Irwin G.
An experiment on color discrimination under commonplace conditions.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 138 (1927). (Abstract).

129. McNicholas, H. J.
On the use of the integrating sphere in reflectometry.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 142 (1927). (Abstract).

130. Winters, S. R.
Colors in relation to business.
Trade Winds (The Union Trust Co., Cleveland, Ohio) 6, 16 (1927).

132. Judd, Deane B.
Purity and saturation; a saturation scale for yellow.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 470 (1927). (Abstract).

133. Judd, Deane B.
The empiric relation between dominant wavelength and purity.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 14, 475 (1927). (Abstract).

134. Davis, Raymond and Gibson, K. S.
Reproducible liquid filters for the determination of the color temperatures of incandescent lamps.
Phys. Rev. (2) 29, 916 (1927). (Abstract).

135. Priest, Irwin G.
Misuse of the name "Leucoscope".
Science 66, 78 (1927).

136. Lofton, R. E.
Study of the windows of window envelopes for the purpose of developing standard specifications.
Tech. Pap. Bur. Stand. 21, 385 (1927) T343.

137. Priest, Irwin G.
Correction of a prevalent error in regard to the data on photometric sensibility as a function of wave length at low brightness.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 15, 82 (1927).

138. Priest, Irwin G.
Note on the relative comfort in reading by artificial daylight and unmodified gas-filled tungsten lamps.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 15, 131 (1927).

139. Gibson, K. S.
Fluorescence as a means of detecting the admixture of refined in unrefined edible olive oil.
Tech. News Bull. Nat. Bur. Stand. No. 127, Nov. 1927.

140. American Standards Association, American Standard colors for traffic signals (American Standards Association, 29 West 39th Street, New York, N. Y.) 1927.

141. Standardization of Lovibond glasses (monthly reports from Colorimetry Section to President of American Oil Chemists' Society).
Oil Fat Ind. 4, 433 (1927); 5, 27, 58, 92, 114, 152, 184 (there are many typographical errors in this report), 220, 247, 278 (1928).

142. Priest, Irwin G.
Tests of color sense of AOCS members and data on sensibility to change in Lovibond red.
Oil Fat Ind. 5, 63 (1928).

143. Judd, Deane B. and Walker, Geraldine K.
A study of 129 Lovibond red glasses with respect to the reliability of their nominal grades.

Oil Fat Ind. 5, 16 (1928).

144. Judd, Deane B.
Saturation of colors determined from the visual response functions.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 16, 115 (1928). (Abstract).

145. Appel, W. D.
A method for measuring the color of textiles.
Amer. Dyest. Rep. 17, 29 (1928).

146. Judd, Deane B.
Sensibility to color change determined from the visual response functions; extension to complete and partial dichromasy.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 16, 115 (1928). (Abstract).

147. Priest, Irwin G. and Gibson, K. S.
Standardizing the red and yellow Lovibond glasses.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 16, 116 (1928). (Abstract).

148. Macbeth, Norman, Color temperature classification of natural and artificial illuminants.
Trans. Illum. Eng. Soc. 23, 302 (1928). (Priest's blue-wedge colorimetric photometer is illustrated in this publication).

149. Priest, Irwin G.
Preliminary data on the least perceptible difference in dominant wavelength by the method of right and wrong answers.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 16, 117 (1928). (Abstract).

150. Davis, Raymond and Gibson, K. S.
Filters for the reproduction of sunlight and the determination of color temperature.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 16, 332 (1928). (Abstract).

151. McNicholas, H. J.
Equipment for routine spectral transmission and reflection measurements.
J. Res. Nat. Bur. Stand. 1, 793, (1928) RP30; J. Opt. Soc. Amer. and Rev. Sci. Instrum. 16, 333 (1928).

152. Davis, Raymond and Gibson, K. S.
Artificial sunlight for photographic sensitometry.
Proc. 7th Int. Cong. of Photography, London, 1928 (W. Heffer and Sons, Ltd., Cambridge, Eng.) p. 161 (1929); J. Soc. Motion Pict. Eng. 12, 225 (1928); Sci. Ind. Photogr. 8, 158 (1928).

153. Coblentz, W. W. and Stair, R.
Transmissive properties of eye-protective glasses and other substances.
Tech. Pap. Bur. Stand. 22, 555 (1927-28) T369.

154. McNicholas, H. J.
Absolute methods in reflectometry.
J. Res. Nat. Bur. Stand. 1, 29 (1928) RP3.

155. Bruce, H. D.
Tinting strength of pigments.
J. Res. Nat. Bur. Stand. 1, 125 (1928) RP7.

156. Judd, Deane B.
Effect of temperature change on the color of red and yellow Lovibond glasses.
J. Res. Nat. Bur. Stand. 1, 859 (1928) RP31.

157. McNicholas, H. J.
Use of the under-water spark with the Hilger sector photometer in ultraviolet spectrophotometry.
J. Res. Nat. Bur. Stand. 1, 939 (1928) RP33.

158. Skogland, J. F.
Tables of spectral energy distribution and luminosity for use in computing light transmissions and relative brightnesses from spectrophotometric data.
Misc. Pub. Bur. Stand. No. 86 (1929) M86.

159. Brode, Wallace R.
The spectral absorption of certain monoazo dyes. I. The effect of position isomerism on the spectral absorption of methyl derivatives of benzeneazophenol.
J. Res. Nat. Bur. Stand. 2, 501 (1929) RP47.

160. Jones, L. A.
Chairman, Optical Society of America Committee on Standard of Photographic Intensity, Report on resolutions dealing with the photographic unit of intensity presented at the 7th Intern. Cong. of Photography.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 18, 162 (1929). (Abstract).

161. McNicholas, H. J.
Apparatus for the measurement of the reflective and transmissive properties

of diffusing media.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 18, 165 (1929). (Abstract).

162. Gibson, K. S.
Apparatus for accurate and rapid measurement of spectral transmission and reflection.
J. Opt. Soc. Amer. and Rev. Sci. Instr. 18, 166 (1929). (Abstract).

163. McNicholas, H. J.
The absorptive properties of carotin and xanthophyll in the visible and ultraviolet.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 18, 172 (1929). (Abstract).

164. Judd, Deane B.
Least retinal illumination by spectral light required to evoke the "blue arcs of the retina".
J. Res. Nat. Bur. Stand. 2, 441 (1929) RP43; J. Opt. Soc. Amer. and Rev. Sci. Instrum. 18, 172 (1929).

165. Priest, Irwin G., Judd, Deane B., Gibson, K. S. and Walker, Geraldine K.
Calibration of sixty-five 35-yellow Lovibond glasses.
J. Res. Nat. Bur. Stand. 2, 793 (1929) RP58.

166. Gibson, K. S. and Davis, Raymond.
Methods for determining the color of sunlight and daylight.
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 18, 442 (1929). (Abstract).

168. Crittenden, E. C. and Taylor, A. H.
An interlaboratory comparison of colored photometric filters.
Trans. Illum. Eng. Soc. 24, 153 (1929).

169. Judd, Deane B.
Review of Ladd-Franklin's "Colour and Colour Theories".
J. Opt. Soc. Amer. and Rev. Sci. Instrum. 19, 103 (1929).

170. Thompson, G. W.
The true tinting strength of white pigments.
Proc. Amer. Soc. Test. Mater. 29, 924 (1929) (Part II).

171. Peters, H. H. and Phelps, F. P.
A technical method of using the mercury arc to obtain data at wave length 560mu in the spectrophotometric analysis of sugar products.
J. Res. Nat. Bur. Stand. 2, 335 (1929) RP38.

172. Appel, W. D.
Quantitative relation between the spectral reflection of textile dyeings and the amount of dye used.
Text. Res. Council, Statler Building, Boston, Mass. (1929).

173. Jones, L. A.
Chairman, Optical Society of America Committee on the unit of photographic intensity, Report.
Proc. 7th Intern. Cong. of Photography, London, 1928 (W. Heffer and Sons, Ltd., Cambridge, Eng.), p. 152, 1929.

174. Judd, Deane B.
Reduction of data on mixture of color stimuli.
J. Res. Nat. Bur. Stand. 4, 515 (1930) RP163; J. Opt. Soc. Amer. and Rev. Sci. Instrum. 18, 441 (1930).

175. Priest, Irwin G. and Riley, J. O.
The selective reflectance of magnesium oxide.
J. Opt. Soc. Amer. 20, 156 (1930).

176. Priest, Irwin G.
Note on the yellowness of commercial magnesium carbonate and the alleged yellowness of magnesium oxide.
J. Opt. Soc. Amer. 20, 157 (1930).

177. Judd, Deane B.
Thomas Young's theory of color vision and the hue change by addition of white light.
J. Opt. Soc. Amer. 20, 156 (1930). (Abstract).

178. Priest, Irwin G.
Note on the relative sensitiveness of direct color comparison and spectrophotometric measurements in detecting slight differences in the spectral distribution of light.
J. Opt. Soc. Amer. 20, 159 (1930).

179. Judd, Deane B.
Precision of color temperature measurements under various observing conditions; a new color comparator for incandescent lamps.
J. Res. Nat. Bur. Stand. 5, 1161 (1930) RP252; J. Opt. Soc. Amer. 21, 145 (1931).

180. Judd, Deane B.
The mixture data embodied in the tentative curves of Hecht's theory of vision.
J. Opt. Soc. Amer. 20, 647 (1930).

181. Gibson, K. S.
The use of the photoelectric cell in spectrophotometry. Photoelectric cells and their applications. (The Physical and Optical Societies, London, England; also obtainable from Adam Hilger, Ltd., London), p. 157 (1930).

182. Davis, Raymond and Gibson, K. S.
Filters for the reproduction of sunlight and daylight and the determination of color temperature.
Misc. Pub. Bur. Stand. No. 114 (1931) M114.

183. Gibson, K. S.
An illumination sphere for reflectometry and photoelectric spectrophotometry.
J. Opt. Soc. Amer. 21, 144 (1931). (Abstract).

184. Judd, Deane B.
Extension of the standard visibility function to intervals of 1 millimicron by third-difference osculatory interpolation.
J. Res. Nat. Bur. Stand. 6, 465 (1931) RP289; J. Opt. Soc. Amer. 21, 267 (1931).

185. Judd, Deane B.
Comparison of distribution curves embodying Wright's recent results with the OSA "excitation" curves.
J. Opt. Soc. Amer. 21, 434 (1931). (Abstract).

187. Judd, Deane B.
A new set of distribution curves for use in colorimetric computation.
J. Opt. Soc. Amer. 21, 436 (1931). (Abstract).

189. Judd, Deane B.
Interpolation of the OSA "excitation" data by the fifth-difference osculatory formula.
J. Res. Nat. Bur. Stand. 7, 85 (1931) RP334; J. Opt. Soc. Amer. 21, 531 (1931).

190. Gibson, K. S.
Spectrophotometry at the Bureau of Standards.
J. Opt. Soc. Amer. 21, 564 (1931).

191. McNicholas, H. J.
The visible and ultraviolet absorption spectra of carotin and xanthophyll and the changes accompanying oxidation.
J. Res. Nat. Bur. Stand. 7, 171 (1931) RP337.

192. Gibson, K. S.
Chairman, Optical Society of America Committee on the photographic standard of intensity, Report on the photographic unit of intensity.
J. Opt. Soc. Amer. 21, 654 (1931); see also Bericht VIII. Internationlen Kongress Photographie, Dresden, 1931 (J. A. Barth, Leipzig, Germany), p. 84 and 424 (1932).

193. Judd, Deane B.
Comparison of Wright's data on equivalent color stimuli with the OSA data.
J. Opt. Soc. Amer. 21, 699 (1931).

194. Davis, Raymond
A correlated color temperature for illuminants.
J. Res. Nat. Bur. Stand. 7, 659 (1931) RP365.

195. Davis, Raymond and Gibson, K. S.
The relative spectral energy distribution and correlated color temperature of the NPL white-light standard.
J. Res. Nat. Bur. Stand. 7, 791 (1931) RP374.

196. Judd, Deane B.
A general formula for the computation of colorimetric purity.
J. Res. Nat. Bur. Stand. 7, 827 (1931) RP377; J. Opt. Soc. Amer. 21, 729 (1931).

197. Colors for sanitary ware.
Commer. Stand. Nat. Bur. Stand. No. 30 (1931); CS30-31.

198. Judd, Deane B.
Chromaticity sensibility to temperature change as a function of color temperature.
J. Opt. Soc. Amer. 22, 9 (1932). (Abstract)

199. Judd, Deane B.
Chromaticity sensibility to stimulus differences.
J. Opt. Soc. Amer. 22, 72 (1932).

200. A report on the spectral reflection of eleven samples of dyed cloth (B. S. Test 64397).
Amer. Dyest. Rep. 21, 163 (1932).

201. Helson, Harry and Judd, Deane B.
A study in photopic adaptation.
J. Exp. Psychol. 15, 380 (1932).

202. Judd, Deane B.
Progress report from the United States of America (Resume of progress in colorimetry since 1927 in America).
Proc. of the Intern. Comm. on Ill., 8th Meeting, Cambridge, 1931

(University Press, Cambridge, England), p. 658 (1932).

203. Judd, Deane B.
Nearest color temperature for stimuli yielding non-Planckian but nearly achromatic colors.
J. Opt. Soc. Amer. 22, 428 (1932). (Abstract).

204. Judd, Deane B.
Investigation of sources of errors in color temperature determinations of incandescent lamps.
J. Opt. Soc. Amer. 22, 429 (1932). (Abstract).

205. Priest, Irwin G.
Report on the work of the Colorimetry Committee of the International Commission on Illumination and the actions taken at the meeting in Cambridge, England, September, 1931.
J. Opt. Soc. Amer. 22, 431 (1932). (Abstract).

206. Kasper, Charles
The structure of the chromic-acid plating bath; the theory of chromium deposition.
J. Res. NBS 9, 353 (1932) RP476.

207. Judd, Deane B.
Sensibility to color-temperature change as a function of temperature.
J. Opt. Soc. Amer. 23, 7 (1933).

208. Tyndall, E.P.T.
Chromaticity sensibility to wave-length difference as a function of purity.
J. Opt. Soc. Amer. 23, 15 (1933).

209. Judd, Deane B.
Saturation scale for yellow colors.
J. Opt. Soc. Amer. 23, 35 (1933).

210. Priest, Irwin G.
A proposed scale for use in specifying the chromaticity of incandescent illuminants and various phases of daylight.
J. Opt. Soc. Amer. 23, 41 (1933).

212. Judd, Deane B.
Computation from spectrophotometric data of trilinear coordinates, dominant wave-length, colorimetric purity and relative brightness on the 1931 CIE basis.
J. Opt. Soc. Amer. 23, 194 (1933). (Abstract).

213. Gibson, K. S.
Transmissions de quatre verres bleus destinés a etre employés comme étalons photometrique internationaux.
Com. Int. des Poids et Measures, Proces-verbaux des seances, Vol. XVI, Annexes du Com. Consultatif d'Elect. et de Phot., No. 40, p. 307, 1933.

214. Gibson, K. S. and Walker, Geraldine K.
Standardization of railway signal glasses - Reports on measurements and investigations undertaken by the Colorimetry Section of the Bureau of Standards at the request of the Signal Section of the American Railway Association.
Signal Section Proceedings, ARA 30, 384 (1933).

215. Gibson, K. S.
Report No. 1. The transmission (ARA scale) of 36 specimens of signal glass relative to transmission of 6 ARA standards marked "J. C. Mock 10/3/30", a report on measurements made at Corning Glass Works, December 9-11, 1930. (See 214).

216. Gibson, K. S. and Walker, Geraldine K.
Report No. 2. Measurements of spectral and luminous transmissions leading to the derivation of new ARA transmissions for the 36 glasses listed in Report No. 1. (See 214).

217. Walker, Geraldine K. and Gibson, K. S.
Report No. 3. Spectral and luminous transmissions and derivation of new values of ARA transmission for the 22 "limit" glasses selected by Committee VI, ARA, at Corning, Nov. 5-6, 1931 and engraved "J.C.M. 11-6-31". (See 214).

219. Gibson, K. S. and Walker, Geraldine K.
Report 4. Chromaticities and luminous transmissions, with illuminants at 1,900°K and 2,848°K, for the 22 "limit" glasses described in Report No. 3. (See 214).

220. Gibson, K. S.
Report No. 5. Tentative specifications for railway signal colors. (See 214).

221. Judd, Deane B.
The 1931 ICI standard observer and coordinate system for colorimetry.
J. Opt. Soc. Amer. 23, 359 (1933).

222. Stair, R. and Coblentz, W. W.
Infrared absorption spectra of some plant pigments.
J. Res. Nat. Bur. Stand. 11, 703 (1933) RP 617.

223. Becker, Genevieve and Appel, W. D.
Evaluation of manila-rope fiber for color.
J. Res. Nat. Bur. Stand. 11, 811 (1933) RP627.

224. Becker, Genevieve
Spectral reflectance of the Philippine Island Government standards for abaca fiber.
J. Res. Nat. Bur. Stand. 11, 823 (1933) RP628.

225. Davis, Raymond and Gibson, K. S.
Filters for producing the color of the equal-energy stimulus.
J. Res. Nat. Bur. Stand. 12, 263 (1934) RP652. The filters are of the type described in 182, 195, 444.

226. Wensel, H. T., Judd, D. B. and Roeser, Wm. F.
The establishment of a color-temperature scale.
J. Opt. Soc. Amer. 24, 55 (1934); J. Res. Nat. Bur. Stand. 12, 527 (1934) RP677.

227. Gibson, K. S. and Walker, Geraldine K.
Standardization and specification of railway signal colors.
J. Opt. Soc. Amer. 24, 57 (1934). (Abstract).

228. Gibson, K. S., Walker, Geraldine K. and Brown, Mabel E.
Filters for testing the reliability of spectrophotometers.
J. Opt. Soc. Amer. 24, 58 (1934). (Abstract). (See also 404, 424, C484).

229. Walker, Geraldine K.
Statistical investigation of the uniformity of grades of 1,000 Lovibond red glasses.
J. Res. Nat. Bur. Stand. 12, 269 (1934) RP653.

230. Judd, Deane B.
Sources of error in measuring opacity of paper by the contrast-ratio method.
J. Res. Nat. Bur. Stand. 12, 345 (1934) RP660.

232. Gibson, K. S. and Walker, Geraldine K.
Standardization of Lovibond red glasses.
J. Opt. Soc. Amer. 24, 163 (1934). (Abstract).

233. Gibson, K. S.
Visual spectrophotometry.
J. Opt. Soc. Am. 24, 234 (1934). (See 288).

234. Wensel, H. T., Roeser, Wm. F., Barbrow, L. E. and Caldwell, F. R.
Derivation of photometric standards for tungsten-filament lamps.
J. Res. Nat. Bur. Stand. 13, 161 (1934) RP699.

235. McNicholas, H. J.
Equipment for measuring the reflective and transmissive properties of diffusing media.
J. Res. Nat. Bur. Stand. 13, 211 (1934) RP704.

236. Judd, Deane B.
Opacity standards.
J. Res. Nat. Bur. Stand. 13, 281 (1934) RP709; Pap. Trade J., Tech. Sec. 100, 4 (1935).

237. Gibson, Kasson S. and Haupt, Geraldine Walker.
Standardization of Lovibond red glasses in combination with Lovibond 35 yellow.
J. Res. Nat. Bur. Stand. 13, 433 (1934) RP718; Oil Soap 11, 246 (1934).

238. Judd, Deane B.
A Maxwell triangle yielding uniform chromaticity scales.
J. Res. Nat. Bur. Stand. 14, 41 (1935) RP756; J. Opt. Soc. Amer. 25, 24 (1935).

239. Judd, Deane B.
Surface color.
J. Opt. Soc. Amer. 25, 44 (1935). (Abstract).

240. Gibson, Kasson S.
A filter isolating 560 mu.
J. Opt. Soc. Amer. 25, 46 (1935). (Abstract).

241. Gibson, Kasson S.
A filter for obtaining light at wavelength 560 mu.
J. Res. Nat. Bur. Stand. 14, 545 (1935) RP785; J. Opt. Soc. Amer. 25, 131 (1935).

242. Judd, Deane B.
Estimation of chromaticity differences and nearest color temperature on the standard 1931 ICI colorimetric coordinate system.
J. Opt. Soc. Amer. 25, 199 (1935). (Abstract).

243. Judd, Deane B.
A method for determining whiteness of paper.
Pap. Trade J., Tech. Sec. 100, 266 (1935); Tech. Ass. Pap., Series 18, 392 (1935).

244. Appel, Wm. D.
Fading of dyeings in radiation of different intensities.
Amer. Dyest. Rep. 24, 306 (1935).

245. Hunter, Richard S.
Reflection measurements on pulp and paper.
Pap. Trade J., Tech. Sec. 100, 333 (1935); Tech. Ass. Pap., Series 18, 405 (1935).

246. Colors and finishes for cast stone.
Commer. Stand. Nat. Bur. Stand. No. 53, 1935; SC53-35.

247. Brewster, Joseph F.
Simplified apparatus for technical sugar colorimetry.
J. Res. Nat. Bur. Stand. 16, 349 (1936) RP878.

248. Judd, Deane B.
The dependence of reflectance and opacity on thickness; relation between contrast ratio and printing opacity.
Pap. Trade J., Tech. Sec. 101, 58 (1935); Tech. Ass. Pap., Series 18, 441 (1935).

249. Gill, L. M.
Chairman, Amer. Oil Chem. Soc., Color glass development committee Report.
Oil Soap 12, 153 (1935).

250. McNicholas, Harry J.
Color and spectral transmittance of vegetable oils.
J. Res. Nat. Bur. Stand. 15, 99 (1935) RP815; Oil Soap 12, 167 (1935).

251. Stair, R. and Coblentz, W. W.
Infrared absorption spectra of plant and animal tissue and of various other substances.
J. Res. Nat. Bur. Stand. 15, 295 (1935) RP830.

252. Priest, Irwin G.
The Priest-Lange reflectometer applied to nearly white porcelain enamels.
J. Res. Nat. Bur. Stand. 15, 529 (1935) RP847; Amer. Enameler 8, No. 11, 3 and 9, No. 1, 5 (1936).

253. Judd, Deane B. and Gibson, K. S.
Note on the effect of a cover glass in reflectance measurements.
J. Res. Nat. Bur. Stand. 16, 261 (1936) RP872.

254. Hunter, Richard S.
Gloss investigations using reflected images of a target pattern.
J. Res. Nat. Bur. Stand. 16, 359 (1936) RP879; J. Opt. Soc. Amer. 26, 190 (1936); Sci. Sect. Nat. Paint, Varn. and Lacquer Ass., Inc., Circular No. 503, April, 1936.

255. Coblentz, W. W. and Stair, R.
Distribution of the energy in the extreme ultraviolet of the solar spectrum.
J. Res. Nat. Bur. Stand. 17, 1 (1936) RP899.

256. Judd, Deane B. and Harrison, W. N.
The specification of light-scattering materials.
Bull. Amer. Ceram. Soc. 15, 78 (1936) (Abstract).

257. Judd, Deane B.
A method for determining whiteness of paper, II.
Pap. Trade J., Tech. Sec. 103, 154 (1936); Tech. Ass. Pap., Series 19, 359 (1936).

258. Terms used in radiation measurements.
Rev. Sci. Instrum. 7, 322 (1936).

259. Hunter, Richard S.
Identification of five different types of gloss effects.
J. Opt. Soc. Amer. 26, 224 (1936); Bull. Amer. Ceram. Soc. 15, 78 (1936); see also Bull. Amer. Soc. Test. Mater., p. 18 (April 1936). (Abstract).

260. Judd, Deane B.
A subtractive colorimeter for the measurement of small chromaticity differences between surfaces of moderate spectral selectivity of reflectance.
J. Opt. Soc. Amer. 26, 225 (1936). (Abstract).

261. Hunter, Richard S.
A null method photoelectric reflectometer.
J. Opt. Soc. Amer. 26, 225 (1936); Bull. Amer. Ceram. Soc. 15, 79 (1936); Better Enameling 7, No. 3, 12 (1936). (Abstract).

262. Gibson, Kasson S., Haupt, Geraldine Walker and Keegan, Harry J.
Standardization and specification of railway signal colors.
J. Opt. Soc. Amer. 26, 226 (1936). (Abstract).

263. Hunter, Richard S.
The estimation of gloss with a luminous target.
J. Opt. Soc. Amer. 26, 304 (1936). (Abstract).

264. Judd, Deane B.
Calibration and use of a subtractive colorimeter for small chromaticity differences on the standard ICI system.
J. Opt. Soc. Amer. 26, 304 (1936). (Abstract).

265. Judd, Deane B.
Changes in color temperature of tungsten-filament lamps at constant voltage.
J. Res. Nat. Bur. Stand. 17, 679 (1936) RP937; J. Opt. Soc. Amer. 26, 409 (1936) and 27, 74 (1937).

266. Judd, Deane B.
Color-blindness and anomalies of vision.
J. Soc. Motion Pict. Eng. 26, 616 (1936).

268. Judd, Deane B.
Estimation of chromaticity differences and nearest color temperature on the standard 1931 ICI colorimetric coordinate system.
J. Res. Nat. Bur. Stand. 17, 771 (1936) RP944; J. Opt. Soc. Amer. 26, 421 (1936).

269. Helson, Harry and Judd, D. B.
An experimental and theoretical study of changes in surface colors under changing illuminations.
Psychol. Bull. 33, 740 (1936). (Abstract).

270. Pharmacy seeks new system of naming colors.
Druggists Cir., p. 31 (Jan. 1937). (KLK).

271. Gibson, Kasson S.
Photoelectric photometers and colorimeters.
Instruments 9, 309, 335 (1936).

272. McNicholas, Harry J.
Selection of colors for signal lights.
J. Res. Nat. Bur. Stand. 17, 955 (1936) RP956.

273. Hunter, Richard S.
Methods of determining gloss.
J. Res. Nat. Bur. Stand. 18, 19 (1937) RP958; Proc. Amer. Soc. Test. Mater. (Part II) 36, 783 (1936).

274. Gibson, Kasson S. and Keegan, Harry J.
The color of water.
J. Opt. Soc. Amer. 27, 58 (1937). (Abstract).

275. Hunter, Richard S.
Goniophotometric data on gloss differences.
J. Opt. Soc. Amer. 27, 59 (1937). (Abstract).

276. Haupt, Geraldine Walker
Statistical investigation of the uniformity of grades of Lovibond red glasses.
J. Opt. Soc. Amer. 27, 63 (1937). (Abstract).

277. Harrison, W. N.
Chairman, Porcelain Enamel Institute Committee on standardization of tests, Reflectance test of opaque white porcelain enamels (Technical Research Section, Educational Bureau, Porcelain Enamel Institute, Inc.), March 1937.

278. Jones, Lloyd A.
Colorimetry: Preliminary draft of a report on nomenclature and definitions.
J. Opt. Soc. Amer. 27, 207 (1937).

279. Judd, Deane B.
Note on choice of apertures in the definitions of specular gloss and contrast gloss.
J. Opt. Soc. Amer. 27, 225 (1937). (Abstract).

280. Hunter, Richard S.
Problems in the development of a multiple-purpose reflectometer.
J. Opt. Soc. Amer. 27, 225 (1937); Bull. Amer. Ceram. Soc. 16, 90 (1937). (Abstract).

282. Gibson, K. S.
The analysis and specification of color.
J. Soc. Motion Pict. Eng. 28, 388 (1937).

283. Gibson, Kasson S.
Review of Hardy's "Handbook of Colorimetry".
Science 85, 545 (1937).

284. Colors for kitchen accessories.
Commer. Stand. Nat. Bur. Stand. No. 62 (1937); CS62-38.

285. Colors for bathroom accessories.
Comm. Stand. Nat. Bur. Stand. No. 63 (1937); CS63-38.

286. Judd, Deane B. with Harrison, W. N., Sweo, B. J., Hickson, E. F., Eickhoff, A. J., Shaw, Merle B. and Paffenbarger, George C.
Optical specification of light-scattering materials.
J. Res. Nat. Bur. Stand. 19, 287 (1937) RP1026; abridged copy for paper industry published in Pap. Trade. J., Tech. Sec. 106, 5 (1938); Tech. Ass. Pap., Series 21, 474 (1938).

287. Gibson, Kasson S.
Note on the spectrophotometric grading of vegetable oils on the N'' Lovibond scale.
Oil Soap 14, 286 (1937).

288. Gibson, Kasson S.
Spectrophotometry. Measurement of radiant energy, edited by W. E. Forsythe (McGraw-Hill Book Co., Inc., New York and London, 1937), Chap. XI, p. 326. (Essentially same as 233).

289. Hunter, Richard S.
Precision and accuracy of apparent reflectance measurements with a photoelectric illumination meter.
J. Opt. Soc. Amer. 28, 51 (1938). (Abstract).

290. Hunter, Richard S.
Development of filters for tri-stimulus and luminosity measurements with barrier-layer photo-cells.
J. Opt. Soc. Amer. 28, 51 (1938). (Abstract).

291. Judd, Deane B.
Uniform tolerances for surface-color specification.
J. Opt. Soc. Amer. 28, 52 (1938). (Abstract).

292. Crittenden, E. C.
A new system of photometric units.
J. Opt. Soc. Amer. 28, 53 (1938). (Abstract).

293. Judd. D. B., Harrison, W. N. and Sweo, B. J.
Optical specification of vitreous enamels.
J. Amer. Chem. Soc. 21, 16 (1938).

294. Judd, Deane B. and Kelly, Kenneth L.
Scientific color naming of drugs.
J, Amer. Pharm. Ass. 27, 208 (1938).

295. Gibson, Kasson S., Teele, Ray P. and Keegan, Harry J.
A new luminosity filter.
J. Opt. Soc. Amer. 28, 178 (1938). (Abstract).

296. Hunter, Richard S.
Further study of the use of filters and barrier-layer photocells for tristimulus colorimetry.
J. Opt. Soc. Amer. 28, 179 (1938). (Abstract).

297. Gibson, Kasson S. and Keegan, Harry J.
On the magnitude of the error resulting from fluorescence in spectrophotometric measurements.
J. Opt. Soc. Amer. 28, 180 (1938). (Abstract).

298. Priest, Irwin G. and Brickwedde, Ferdinand G.
Minimum perceptible colorimetric purity as a function of dominant wave length.
J. Res. Nat. Bur. Stand. 20, 673 (1938) RP1099; J. Opt. Soc. Amer. 28, 133 (1938).

298a. Coblentz, W. W. and Stair, R.
Spectral-transmissive properties and use of colored eye-protective glasses.
NBS Circ. 421 (June 1938). See C471

299. Judd, Deane B.
Review of Vernon W. Grant's "Psychological Optics".
Rev. Sci. Instrum. 9, 301 (1938).

300. Schoonover, I. C. and Sweeney, W. T.
Some properties of two types of resins used for dentures.
J. Amer. Dent. Ass. Dent. Cosmos 25, 1487 (1938).

301. Gibson, Kasson S. and Keegan, Harry J.
Calibration and operation of the General Electric Recording Spectrophotometer of the National Bureau of Standards.
J. Opt. Soc. Amer. 28, 372 (1938).

302. Judd, Deane B.
Inter-Society Color Council.
Bull. Amer. Ceram. Soc. 17, 379 (1938).

303. Judd, Deane B.
Designation of filters for theatrical lighting.
J. Opt. Soc. Amer. 28, 390 (1938).

304. Haupt, Geraldine Walker.
Departures from additivity among Lovibond red glasses in combination with Lovibond 35 yellow.
Oil and Soap 15, 282 (1938).

305. Coblentz, W. W. and Stair, R.
Note on the spectral reflectivity of rhodium.
J. Res. Nat. Bur. Stand. 22, 93 (1939) RP1168.

306. Gibson, K. S., Haupt, Geraldine Walker and Keegan, H. J.
Standardization of railway signal glasses -- Reports on measurements and investigations undertaken by the Colorimetry Section of the National Bureau of Standards at the request of the Signal Section, AAR, Signal Section Proceedings, AAR. 36, 136 (1939).

307. Report No. 6. Examination of 65 duplicate limit glasses. (See 306). (KSG and GWH).

308. Report No. 7. Colorimetric data leading to specification 59-38 for kerosene hand lantern globes; comparison of specifications 59-38, 69-38 and 69-35; certification of duplicate lantern glasses. (See 306). (KSG & GWH).

309. Hunter, Richard S. and Judd, Deane B.
Development of a method of classifying paints according to gloss.
Bull. Amer. Soc. Test. Mater. (260 S. Broad Street, Philadelphia, Pa.) No. 97, 11 (1939); Paint and Varnish Production (Manager (Mills Building, Washington, D.C.) 19, 152 (1939). (KSG & GWH).

310. Crittenden, E. C.
Terminology and standards of illumination.
J. Opt. Soc. Amer. 29, 103 (1939).

311. Judd, Deane B.
The Inter-Society Color Council tentative system of color names.
J. Opt. Soc. Amer. 29, 142 (1939). (Abstract).

312. Gibson, Kasson S., Teele, Ray P. and Keegan, Harry J.
An improved luminosity filter.
J. Opt. Soc. Amer. 29, 144 (1939). (Abstract).

313. Judd, Deane B.
Definition of artificial daylight.
J. Opt. Soc. Amer. 29, 144 (1939). (Abstract).

314. Judd, Deane B.
Definition and tolerances for artificial daylight for color matching.
J. Opt. Soc. Amer. 29, 145 (1939). (Abstract).

315. Hunter, Richard S.
Progress in developing a photo-electric method for measuring color difference.
Bull. Amer. Ceram. Soc. 18, 121 (1939). (Abstract).

316. Gibson, K. S. and Hickson, E. F.
Report on the measurement and specification of the color designated as National School Bus Chrome (1939).
(Professor Frank W. Cyr, Chairman, Nat. Con. School Bus Standards, Teachers College, Columbia University, New York, N. Y.). (See 434 and 436).

317. Gathercoal, E. N.
Color names in the botanical, chemical and pharmaceutical monographs.
Bull. Nat. Formulary Comm. 7, 269 (1939).

318. Gibson, Kasson S. and Haupt, Geraldine Walker.
Standardization of the luminous-transmission scale used in the specification of railroad signal glasses.
J. Res. Nat. Bur. Stand. 22, 627 (1939) RP1209; J. Opt. Soc. Amer. 29, 188 (1939).

319. MacAdam, Dunlap J., Jr. and Geil, Glenn W.
Rate of oxidation of steels as determined from interference colors of oxide films.
J. Res. Nat. Bur. Stand. 23, 63 (1939) RP1221.

320. Judd, Deane B.
Specification of uniform color tolerances for textiles.
Text. Res. (65 Franklin Street, Boston, Mass.) 9, 253 and 292 (1939).

321. Judd, Deane B.
Specification of color tolerances at the National Bureau of Standards.
Amer. J. Psychol. (Morrill Hall, Cornell Univ., Ithaca, New York) 52, 418 (1939); J. Opt. Soc. Amer. 29, 264 (1939). (Abstract).

322. Judd, Deane B.
The physics of color tolerance.
Amer. Dyest. Rep. (Amer. Ass. of Textile Chem. and Colorists, 440 Fourth Avenue, New York, N. Y.) 28, 441 (1939); J. Opt. Soc. Amer. 29, 261 (1939). (Abstract).

322a. Breckenridge, F. C. and Schaub, W. R.
Rectangular uniform-chromaticity-scale coordinates.
J. Opt. Soc. Amer. 29, 370 (1939).

323. Judd, Deane B. and Kelly, Kenneth L.
Method of designating colors.
J. Res. Nat. Bur. Stand. 23, 355 (1939) RP1239.

324. Hoffman, James I. and Lundell, G.E.F.
Separation and colorimetric determination of Rhenium and Molybdenum.
J. Res. Nat. Bur. Stand. 23, 497 (1939) RP1248.

325. Scientific naming of colors in the U.S.P. and N.F. monographs.
Bull. Nat. Formulary Comm. 8, 17 (1939). (KLK).

326. Gibson, Kasson S.
Spectral luminosity factors.
J. Opt. Soc. Amer. 30, 51 (1940).

327. Gibson, Kasson S.
Approximate spectral energy distribution of skylight.
J. Opt. Soc. Amer. 30, 88 (1940). (Abstract).

328. Kelly, Kenneth L.
Scientific color names in the USP and NF.
USP Cir. 24, p. 55-V (1940).

328a. Institute of traffic Engineers, Standards of the, Adjustable Face Control Signal Head Standards, Tech. Report No. 1, 1940 Proceedings. (KSG).

329. Judd, Deane B.
Hue, saturation and lightness of surface colors with chromatic illumination
J. Res. Nat. Bur. Stand. 24, 293 (1940) RP1285; J. Opt. Soc. Amer. 30, 1 (1940).

330. Hunter, Richard S.
Sources of error in operation of the multipurpose reflectometer.
J. Opt. Soc. Amer. 30, 89 (1940). (Abstract).

331. Hunter, R. S.
Correction of multipurpose reflectometer data.
Bull Amer. Ceram. Soc. 19, 132 (1940). (Abstract).

332. Hunter, Richard S.
Further progress in developing a photoelectric method for measuring color difference.
Bull Amer. Ceram. Soc. 19, 133 (1940). (Abstract).

333. Hunter, Richard S.
Applications and accuracy of three-filter photoelectric colorimetry.
J. Opt. Soc. Amer. 30, 272 (1940). (Abstract).

334. Gathercoal, E. N. and Kelly, Kenneth L.
General notice on color terms.
Bull. Nat. Formulary Comm. 8, 201 (1940).

335. Kelly, Kenneth L.
A preliminary report on the suitability of the Hunter multi-purpose reflectometer for color measurement of near whites.
Bull. Nat. Formulary Comm. 8, 229 (1940).

336. Gibson, Kasson S.
Survey of spectrophotometers.
Tech. Ass. Papers 23, 475(1940); Pap. Trade J., Tech. Sec. 111, 135 (1940); J. Opt. Soc. Amer. 30, 272 (1940).

337. Judd, Deane B.
Systematic color designations for paper.
Pap. Trade J., Tech. Sec. 111, 201 (1940); Tech. Ass. Pap. 23, 512 (1939).

338. Judd, Deane B. and Lewis, Lester C.
Introductory dialogue (for a symposium on spectrophotometry in the pulp and paper industries).
Tech. Ass. Pap. 23, 473, 477, 479, 489, 490, 493, 499 and 505 (1940); Pap. Trade J., Tech. Sec. 111, 133, 137, 141, 151, 155, 165, 183 and 193 (1940); J. Opt. Soc. Amer. 30, 272 (1940). (Abstract).

339. Kelly, Kenneth L.
Instructions for determining the color names for drugs and chemicals.
Bull. Nat. Formulary Comm. 8, 359 (1940).

340. Judd, Deane B.
The Munsell Color System, Foreword.
J. Opt. Soc. Amer. 30, 574 (1940).

341. Hunter, Richard S.
A multipurpose photoelectric reflectometer.
J. Res. Nat. Bur. Stand. 25, 581 (1940) RP1345; J. Opt. Soc. Amer. 30, 536 (1940).

342. Gibson, Kasson S. and Nickerson, Dorothy.
An analysis of the Munsell Color System based on measurements made in 1919 and 1926.
J. Opt. Soc. Amer. 30, 591 (1940).

343. Hunter, Richard S.
Photoelectric colorimetry.
Bull. Amer. Soc. Test. Mater. No. 108, 13 (Jan. 1941).

344. Judd, Deane B.
Introduction to color.
Part of Symposium on Color, pub. by the Amer. Soc. Test. Mater., Mar. 5, 1941.

345. Judd, Deane B.
Introduction to color.
Bull. Amer. Soc. Test. Mater. No. 108, 11 (1941).

346. Wood, Lawrence A.
The optical properties of rubber.
J. Appl. Phys. 12, 119 (1941).

347. Hunter, Richard S.
Examples of color measurements with the multipurpose reflectometer and tristimulus filters.
Bull. Amer. Ceram. Soc. 20, 91 (1941).

348. Moore, Dwight G. and Hunter, Richard S.
Use of liquid surfaces as standards of specular gloss.
J. Amer. Ceram. Soc. 24, 167 (1941).

349. Judd, Deane B.
Color systems and their inter-relation.
Illum. Eng. 36, 336 (1941).

350. Judd, Deane B.
The definition of black and white.
Amer. J. Psychol. 54, 289 (1941).

351. Hague, John L. and Bright, Harry A.
Colorimetric determination of phosphorus in steel and cast iron.
J. Res. Nat. Bur. Stand. 26, 405 (1941) RP1386.

352. Scofield, Francis, Judd, Deane B. and Hunter, Richard S.
A proposed method of designating color.
Bull. Amer. Soc. Test. Mater. No. 110, p. 19 (May 1941).

353. Rodden, Clement J.
Spectrophotometric determination of praseodymium, neodymium and samarium.
J. Res. Nat. Bur. Stand. 26, 557 (1941) RP1395.

354. Gibson, Kasson S. and Keegan, Harry J.
Use of didymium glasses for wave-length calibration of recording spectrophotometers.
J. Opt. Soc. Amer. 31, 462 (1941). (Abstract).

355. Judd, Deane B.
Whiteness of light surface-colors.
J. Opt. Soc. Amer. 31, 462 (1941). (Abstract).

356. Hunter, Richard S.
Permissible short cuts in the photoelectric tristimulus measurement of color difference.
J. Opt. Soc. Amer. 31, 463 (1941). (Abstract).

357. Teele, Ray P.
A physical photometry.
J. Res. Nat. Bur. Stand. 27, 217 (1941) RP1415; J. Opt. Soc. Amer. 31, 696 (1941).

358. Judd, Deane B.
Methods of designating color.
Bull. Amer. Ceram. Soc. 20, 375 (1941).

359. Kelly, Kenneth L.
The success of the ISCC-NBS system of color names in the Chemical Monographs.
Bull. Nat. Formulary Comm. 9, 302 (1941).

360. Launer, Herbert F.
Reflection-transmission relationships in sheet materials.
J. Res. Nat. Bur. Stand. 27, 429 (1941) RP1430.

361. Wingfield, Baker and Acree, S. F.
Effects of hydrochloric acid and salts on the absorption of light by b-naphthoquinonesulfonic acid.
J. Res. Nat. Bur. Stand. 27, 361 (1941) RP1424.

362. Beek, John, Jr.
The carbohydrate content of collagen.
J. Res. Nat. Bur. Stand. 27, 507 (1941) RP1438.

363. Hunter, Richard S.
The accurate measurement of specular gloss.
J. Opt. Soc. Amer. 31, 758 (1941). (Abstract).

364. Judd, Deane B.
Colorimetry of pulp and paper with special reference to "Brightness" and "Whiteness".
Pulp Pap. Mag. Can. 43, No. 2, 94 (1942).

365. Crittenden, E. C.
Chairman, Illuminating Engineering Nomenclature and Photometric Standards. American Standard, approved February 27, 1942 by American Standards Association, ASA Z7.1-1942. Prepared under the

direction of and issued by The Illuminating Engineering Society. Pub. also as Report of IES Committee on Nomenclature and Standards.
Illum. Eng. 36, 813 (1941).

366. Rodden, Clement J.
Spectrophotometric determination of dysprosium, holmium, erbium, thulium, and ytterbium.
J. Res. Nat. Bur. Stand. 28, 265 (1942) RP1456.

367. MacAdam, Dunlap J., Jr. and Geil, Glenn W.
Rate of oxidation of typical nonferrous metals as determined by interference colors of oxide films.
J. Res. Nat. Bur. Stand. 28, 593 (1942) RP1470.

368. Eickhoff, Arnold J. and Hunter, Richard S.
Measurement of the fading rate of paints.
J. Res. Nat. Bur. Stand. 28, 773 (1942) RP1478; Paint, Oil Chem. Rev. 104, 9 (June 18, 1942) and 6 (July 2, 1942).

369. Specification and description of color. American War Standard of the American Standards Association (70 East 45th Street, New York 17, N. Y.), ASA-Z44-1942, approved June 17, 1942; Bull. Amer. Soc. Test. Mater. No. 119, 19 (1942). (HJK).

369a. Hunter, Richard S.
Photoelectric tristimulus colorimetry with three filters.
NBS Circ. 429 (July 1942); J. Opt. Soc. Amer. 32, 509 (1942); part of ASTM Symp. on Color, Am. Soc. Test. Materials, March 5, 1941.

370. Judd, Deane B.
Fresnel reflection of diffusely incident light.
J. Res. Nat. Bur. Stand. 29, 329 (1942) RP1504.

371. Judd, Deane B.
Facts of color-blindness.
J. Opt. Soc. Amer. 33, 294 (1943).

372. Judd, Deane B.
Colorblindness and the detection of camouflage.
Science 97, 544 (1943).

373. Newhall, S. M., Nickerson, D. and Judd, D. B.
Final report of the O.S.A. Subcommittee on the spacing of the Munsell colors.
J. Opt. Soc. Amer. 33, 385 (July 1943).

374. Kelly, Kenneth L., Gibson, Kasson S. and Nickerson, Dorothy
Tristimulus specification of the Munsell Book of Color from spectrophotometric measurements.
J. Res. Nat. Bur. Stand. 31, 55 (1943) RP1549; J. Opt. Soc. Amer. 33, 355 (1943).

375. Sager, Elizabeth E., Schooley, Marjorie R. and Acree, S. F.
The assay of potassium p-phenolsulfonate, its pH range and its ultraviolet absorption spectrum.
J. Res. Nat. Bur. Stand. 31, 197 (1943) RP1558.

376. Chapters from the forthcoming report of the Optical Society of America Committee on Colorimetry, J. Opt. Soc. Amer. as follows:
Chapter 2. The concept of color, 33, 544 (1943).
Chapter 5. Physical concepts: Radiant energy and its measurement, 34, 183 (1944).
Chapter 6. The psychophysics of color, 34, 245 (1944).
Chapter 7. Quantitative data and methods for colorimetry, 34, 633 (1944).
Chapter 8. Colorimeters and color standards, 35, 1 (1945).

377. Kelly, Kenneth L.
Color designations for lights.
J. Res. Nat. Bur. Stand. 31, 271 (1943) RP1565; J. Opt. Soc. Amer. 33, 627 (1943).

378. Hunter, Richard S.
The geometric identification of reflection and transmission measurements.
J. Opt. Soc. Amer. 33, 685 (1943). (Abstract).

379. Sager, Elizabeth E., Keegan, Harry J. and Acree, S. F.
Basic ionization constant of metacresolsulfonpthalein; pH values and salt effects.
J. Res. Nat. Bur. Stand. 31, 323 (1943) RP1569.

380. Judd, Deane B.
Color vision.
Medical Physics, p. 265, Otto Glasser, Editor (Chicago Year Book Pub., Chicago, Ill. 1944). (See 429a).

381. Projector, T. H., Laufer, M. K. and Douglas, C. A.
An improved "zero-resistance" circuit

for photo-cell photometry.
Rev. Sci. Instrum. 15, 107 (1944).

382. Judd, Deane B.
Small Color Differences, Discussion Session on, held in conjunction with the American Association of Textile Chemists and Colorists and the Federation of Paint and Varnish Production Clubs. March 1944.
Amer. Dyest. Rep. 33, 11 (May 1944), 33, 12 (June 1944), 33, 13 (June 1944), 33, 14 (July 1944).

383. Judd, Deane B.
Symposium on the Ostwald color system. Foreword.
J. Opt. Soc. Amer. 34, 353 (1944).

384. Hunter, Richard S.
Methods and standards for gloss measurement of camouflage materials.
Metal Finish. (11 W. 42nd Street, New York 18, N. Y.) 42, 519 (1944).

385. Judd, Deane B.
Standard response functions for protanopic and deuteranopic vision.
J. Res. Nat. Bur. Stand. 33, 407 (1944) RP1618; J. Opt. Soc. Amer. 35, 199 (1945). (See 416a).

386. Judd, Deane B.
The relation of protanopic to normal vision.
J. Opt. Soc. Amer. 34, 768 (1944). (Abstract).

387. Keegan, Harry J.
On the measurement of the spectral apparent reflectance of low reflecting materials.
J. Opt. Soc. Amer. 34, 770 (1944). (Abstract).

388. Keegan, Harry J. and Gibson, Kasson S.
On the use of working standards of didymium and vitrolite glasses for spectrophotometric measurements.
J. Opt. Soc. Amer. 34, 770 (Dec. 1944). (Abstract).

389. Kelly, K. L.
A new system of color matching fluids.
J. Amer. Pharm. Ass. 34, 59 (1945).

389a. Nickerson, Dorothy, Kelly, K. L. and Stultz, K. F.
Color of Soils.
J. Opt. Soc. Amer. 35, 297 (1945)

390. MacLean, Marion E., Jenks, Priscilla J. and Acree, S. F.
Comparison of the purity of samples of organic solvents by ultraviolet spectrophotometry.
J. Res. Nat. Bur. Stand. 34, 271 (1945) RP1643.

391. Teele, Ray P.
Photometer for luminescent materials.
J. Res. Nat. Bur. Stand. 34, 325 (1945) RP1646; J. Opt. Soc. Amer. 35, 373 (1945).

392. Judd. Deane B.
Color standards for ruby mica.
J. Res. Nat. Bur. Stand. 35, 245 (1945) RP1671.

393. Gibson, Kasson S.
Spectrophotometers.
Proc. Amer. Soc. Test. Mater. 44, 725 (1945).

394. Keegan, Harry J.
Method for the spectrophotometry of reflection-reducing films on prisms.
J. Opt. Soc. Amer. 35, 807 (1945). (Abstract).

395. Judd, D. B.
Application of the spectrophotometer to colorimetry.
Engineering Experiment Station News (Ohio State University) 17, 32 (Dec. 1945).

396. Gibson, Kasson S., Haupt, Geraldine Walker and Keegan, Harry J.
Specification of railroad signal colors and glasses.
J. Res. Nat. Bur. Stand. 36, 1 (1946) RP1688; J. Opt. Soc. Amer. 35, 772 (1945).

396a. Judd, Deane B.
Units in the trichromatic system.
J. Opt. Soc. Amer. 36, 120 (L) (1946).

397. Reimann, Genevieve, Judd, Deane B. and Keegan, Harry J.
Spectrophotometric and colorimetric determination of the colors of the TCCA standard color cards.
J. Res. Nat. Bur. Stand. 36, 209 (1946) RP1700; J. Opt. Soc. Amer. 36, 128 (1946). Condensations of this paper appear in Amer. Dyest. Rep. 35, 323 (1946) and in Text. Color. Converter 68, No. 6 (1946).

398. Hunter, Richard S.
A glossmeter for smoothness comparisons of machine-finished surfaces.
J. Res. Nat. Bur. Stand. 36, 385 (1946) RP1708; J. Opt. Soc. Amer. 36, 178 (1946).

399. Reimann, Genevieve and Carmine, Earl J.
A device to facilitate the reading of spectrophotometric curves.
J. Opt. Soc. Amer. 36, 235 (1946).

400. Gibson, Kasson S., Haupt, Geraldine W. and Keegan, Harry J.
Comparison of railroad, traffic, and marine signal color specifications.
J. Opt. Soc. Amer. 36, 366 (1946). (Abstract).

401. Keegan, Harry J.
Specification of the colors of the A.S.A. safety color code.
J. Opt. Soc. Amer. 36, 367 (1946). (Abstract).

402. Reimann, Genevieve, Judd, Deane B. and Keegan, Harry J.
Color gets fingerprinted.
Text. Color. Converter 68, 18 (1946).

403. Stair, Ralph and Faick, Conrad A.
Infrared absorption spectra of some experimental glasses containing rare earth and other oxides.
J. Res. Nat. Bur. Stand. 38, 95 (1947) RP1761.

403a. Announcement of changes in electrical and photometric units.
NBS Circ. 459 (May 1947).

404. Gibson, Kasson S. and Balcom, Margaret M.
Transmission measurements with the Beckman quartz spectrophotometer.
J. Res. Nat. Bur. Stand. 38, 601 (1947) RP1798; J. Opt. Soc. Amer. 37, 593 (1947).

405. Haupt, Geraldine Walker and Douglas, Florence Lesch
Chromaticities of Lovibond glasses.
J. Res. Nat. Bur. Stand. 39, 11 (1947) RP1808; J. Opt. Soc. Amer. 37, 698 (1947).

406. Colors for molded area plastics.
Commer. Stand. Nat. Bur. Stand. No. 147, 1947; CS147-47. (Sets of these colors are available from Manufacturing Chemists' Association, Woodward Building, 15th and H Streets, N. W., Washington, D.C. for $2.50 per set). (HJK & KLK).

407. ASTM proposed method for determination of color index of petroleum products by photoelectric colorimeter, report of Committee D-2 on petroleum products and lubricants, Appendix IV, Proceedings.
Amer. Soc. Test. Mater. 47, 307 (1947); Amer. Soc. Test. Mater. Standards on petroleum products and lubricants, October 1947, p. 615.

408. Keegan, Harry J.
Standards of reflectance.
J. Opt. Soc. Amer. 38, 658 (1948). (Abstract); Anal. Chem. 20, 387 (1948). (Abstract).

409. Launer, Herbert F.
Light-sensitive papers as controls for testing textile colorfastness and stability of materials under arc lamp exposure.
J. Res. Nat. Bur. Stand. 41, 169 (1948) RP1916.

410. Judd, Deane B.
Color perceptions of deuteranopic and protanopic observers.
J. Res. Nat. Bur. Stand. 41, 247 (1948) RP1922. Condensation of this paper appeared in J. Opt. Soc. Amer. 39, 252 (1949).

410a. Stair, Ralph
Spectral-transmissive properties and use of eye-protective glasses.
NBS Circ. 471 (Oct. 1948). Supersedes C421.

411. Judd, Deane B.
The Bezold-Brucke phenomenon and the Hering theory of vision.
J. Opt. Soc. Amer. 38, 1095 (1948). (Abstract).

412. Florence, Jack M., Glaze, Francis W., Hahner, Clarence H. and Stair, Ralph.
Transmittance of near infrared energy by binary glasses.
J. Res. Nat. Bur. Stand. 41, 623 (1948) RP1945.

413. Teele, Ray P. and Gibson, Kasson S.
A standard luminosity filter.
J. Opt. Soc. Amer. 38, 1096 (1948). (Abstract).

414. Judd, Deane B.
Response functions for types of vision according to the Muller theory.
J. Res. Nat. Bur. Stand. 42, 1 (1949) RP1946.

415. Color perception of the partially color-blind.
Tech. News Bull. Nat. Bur. Stand. 33, 1 (Jan. 1949). (DBJ).

416. Stair, Ralph, Glaze, Francis W. and Hall, Joseph J.
The spectral-transmissive characteristics of some German glasses.
The Glass Ind. (June 1949).

416a. Judd, Deane B.
Standard response functions for protanopic and deuteranopic vision.
J. Opt. Soc. Amer. 39, 505 (L) (1949). (See 385).

417. Granville, Walter C. and Judd, Deane B.
Metameric colors and the macular pigment.
J. Opt. Soc. Amer. 39, 632 (1949). (Abstract).

418. ICI (CIE) standard observer for colorimetry.
Tech. News Bull. Nat. Bur. Stand. 33, 87 (1949). (DBJ).

419. Judd, Deane B.
Current views on colour blindness.
Documenta Opthalmologica 3, 251 (1949).

420. Judd, Deane B.
A comparison of direct colorimetry of titanium pigments with their indirect colorimetry based on spectrophotometry and a standard observer.
J. Res. Nat. Bur. Stand. 43, 227 (1949) RP2024; J. Opt. Soc. Amer. 39, 945 (1949); errata 40, 52 (1950).

421. Colors for polystyrene plastics.
Commer. Stand. Nat. Bur. Stand. No. 156, 1949; CS 156-49. (Sets of these colors are available from the Manufacturing Chemists' Association, Woodward Building, 15th and H Streets, N. W., Washington, D.C. for $3.00 per set). (HJK and KLK).

422. Judd, Deane B.
The 1949 scale of color temperature.
J. Res. Nat. Bur. Stand. 44, 1 (1950) RP2053.

422a. Judd, Deane B.
Colorimetry.
NBS Circ. 478 (March 1950). Also with some changes as Measurement and Specification of Color, Chapter 9 in Mellon, Analytical Absorption Spectroscopy (John Wiley & Sons, New York, New York 1950). Also Boletim de Normalizacao Lisboa 3, 183 (1954).

423. Judd, Deane B.
El sistema ICI para la specification del color (The CIE system of color specification).
Anales de la Real Sociedad Espanola de Fisica y Quimica (A) 46, 123 (1950).

424. Gibson, Kasson S. and Belknap, Marion A.
Permanence of glass standards of spectral transmittance.
J. Res. Nat. Bur. Stand. 44, 463 (1950) RP2093. Condensation of this paper appeared in J. Opt. Soc. Amer. 40, 435 (1950).

424a. Gibson, Kasson S.
Spectrophotometry (200 to 1000 millimicrons).
NBS. Circ. 484 (Sept. 1949). Also as Spectrophotometers: Ultraviolet and visible regions. Chapter 5 in Mellon, Analytical Absorption Spectroscopy (John Wiley and Sons, New York, N. Y., 1950).

425. Commission Internationale de l'Éclairage, Report of Amer. Secretariat Committee on Colorimetry and Artificial Daylight.
Proc. eleventh session, Paris, 1948, p. 238 (1950). (DBJ).

426. Judd, Deane B., Plaza, Lorenzo and Belknap, Marion A.
A suggested relocation and respacing of the Union colorimeter scale for lubricating oil and petrolatum.
J. Res. Nat. Bur. Stand. 44, 559 (1950) RP2103. Condensation of this paper appeared in Bull. Amer. Soc. Test. Mater. No. 167, 63 (TP145) (June 1950).

427. Hammond, Harry K. III and Nimeroff, Isadore
Measurement of sixty-degree specular gloss.
J. Res. Nat. Bur. Stand. 44, 585 (1950) RP2105. Condensation of this paper appeared in Bull. Amer. Soc. Test. Mater. No. 169, 54 (Oct. 1950).

428. Projector, T. H.
Report on tests of flicker in color television.
Annex D to The Present Status of Color Television, Report of the Advisory Committee on Color Television to the Committee on Interstate and Foreign Commerce, United States Senate, July 14, 1950; Proc. I. R. E. 38, 998 (1950).

429. Judd, Deane B., Plaza, L. and Balcom, M. M.
Report on the fidelity of color reproduction by the CBS and RCA systems.
Annex E to the Present Status of Color Television, Report of the Advisory Committee on Color Television to the Committee on Interstate and Foreign Commerce, United States Senate, July 14, 1950; Proc. I. R. E. 38, 1000 (1950).

429a. Judd, Deane B.
Vision: Color.
Medical Physics (Year Book Publishers, Chicago, 1950), Vol. II, page 1149. (See 380).

430. Judd, Deane B., Plaza, Lorenzo and Farnsworth, Dean.
Tritanopia with abnormally heavy ocular pigmentation.
J. Opt. Soc. Amer. 40, 833 (1950).

431. Judd, Deane B.
Ceguera para el color y teorias de la vision chromatica (Color blindness and color theories).
Anales de la Real Sociedad Espanola de Fisica y Quimica (A) 47, 35 (1951).

432. Keegan, Harry J. and O'Neill, H. T.
Spectrophotometric study of autumn leaves.
J. Opt. Soc. Amer. 41, 284 (1951). (Abstract).

432a. Keegan, Harry J.
Federal Color Card for Paint.
J. Opt. Soc. Amer. 41, 649 (1951).

433. Barbrow, L. E.
International Commission on Illumination, adapted from report by L. E. Barbrow, Secretary of the U.S. National Comm., J. Opt. Soc. Amer. 41, 734 (1951).

434. Keegan, Harry J., Schleter, John C., Kelly, Kenneth L. and Sward, George G.
Standardization of safety colors.
J. Opt. Soc. Amer. 41, 874 (1951). (Abstract). (See 316 and 436).

435. Judd, Deane B.
Basic correlates of the visual stimulus.
Chapter 22 in Stevens Handbook of Experimental Psychology (John Wiley & Sons, New York, N. Y., 1951).

436. Keegan, H. J., Kelly, K. L. and Schleter, J. C.
Standardization of national school bus chrome.
J. Opt. Soc. Amer. 42, 290 (1952). (Abstract). (See 316 and 434).

437. Commission Internationale de l'Éclairage, Report of (American) Secretariat Committee on Colorimetry and Artificial Daylight.
Proceedings, twelfth session Stockholm, 1951, 1, 7, p. 1 (1952). (DBJ).

437a. Preservation of the Declaration of Independence and the Constitution of the United States.
NBS Circ. 505 (July 1951).

438. Hammond, Harry K. III and Nimeroff, I.
Minimizing anomalies in reflectance measurements with the Beckman quartz spectrophotometer.
J. Opt. Soc. Amer. 42, 367 (1952).

439. Haupt, Geraldine Walker
An alkaline solution of potassium chromate as a transmittancy standard in the ultraviolet.
J. Res. Nat. Bur. Stand. 48, 414 (1952) RP2331. Condensation of this paper appeared in J. Opt. Soc. Amer. 42, 441 (1952).

440. Nimeroff, Isadore
Analysis of goniophotometric reflection curves.
J. Res. Nat. Bur. Stand. 48, 441 (1952) RP2335. Condensation of this paper appeared in J. Opt. Soc. Amer. 42, 579 (1952).

441. Helson, Harry, Judd, Deane B. and Warren, Martha H.
Object-color changes from daylight to incandescent filament illumination.
Illum. Eng. 47, 221 (1952).

442. Judd, Deane B.
Color in Business, Science, and Industry.
(John Wiley & Sons, New York, N. Y., 1952) ix + 401.

443. IES Lighting Handbook, Second Edition. (Illuminating Engineering Society, New York, 1952).

444. Davis, Raymond, Gibson, Kasson S. and Haupt, Geraldine Walker.
Spectral energy distribution of the International Commission on Illumination light sources A, B, and C.

J. Res. Nat. Bur. Stand. 50, 31 (1953) RP2384. Condensation of this paper appeared in J. Opt. Soc. Amer. 43, 172 (1953). (See 225).

445. Keegan, H. J. and Schleter, J. C. Use of reflection spectra for photointerpretation purposes. Photogrammetric Eng. 19, 107 (1953). (Abstract).

445a. Protective display lighting of historical documents. NBS Circ. 538 (April 1953).

446. Jerome, Charles W. and Judd, D. B. Specification of color-rendering properties of fluorescent lamps. Illum. Eng. 48, 259 (1953).

447. Nimeroff, I. Propagation of errors in spectrophotometric colorimetry. J. Opt. Soc. Amer. 43, 531 (1953).

448. Judd, Deane B. Entoptic color-perceptions of the macular pigment by observers of normal and color-defective vision according to a three-components theory. Publicado en "Coloquio Sobre Problemas Opticos de la Vision", Tomo II, Madrid, Spain, 1953.

449. Hammond, Harry K. III and Ingle, George W. Measurement of color, gloss and haze. Symposium on Plastics Testing, Amer. Soc. Test. Mater. Special Technical Publication No. 132, p. 25 (1953).

450. Newman, S. B., Hammond, Harry K., III and Riddel, H. F. Becker value of Manila rope by photoelectric reflectometry. J. Res. Nat. Bur. Stand. 51, 141 (1953) RP2443; Bull. Amer. Soc. Test. Mater. No. 199, 84 (July 1954).

451. The Science of Color. Committee on Colorimetry of the Optical Society of America 1932-1952 (Thomas Y. Crowell Co., New York, N. Y., 1953). 385 p. (KSG & DBJ).

452. Nimeroff, I. and Wilson, S. W. A colorimeter for pyrotechnic smokes. J. Res. Nat. Bur. Stand. 52, 195 (1954) RP2488. Condensation of this paper appeared in J. Opt. Soc. Amer. 44, 299 (1954).

453. Harrison, L. S. An investigation of the damage hazard in spectral energy. Illum. Eng. 49, 253 (1954).

454. Keegan, Harry J., Belknap, Marion A. and Cordrey, Dorothy J. Spectral transmissive properties of five selected optical glasses. J. Res. Nat. Bur. Stand. 52, 305 (1954) RP2505.

455. Judd, Deane B. Instruments for measuring gloss, hiding power, and color of paint films. Amer. Paint J. 38, 66 (1954).

456. Judd, Deane B. Problemas actuales del color. Instituto de Optica "Daza de Valdes", Madrid (1954).

457. Wyszecki, G. Invariance of insidedness in projective transformations of the Maxwell triangle. J. Opt. Soc. Amer. 44, 524 (1954).

458. Wyszecki, Günter A regular rhombohedral lattice sampling of Munsell renotation space. J. Opt. Soc. Amer. 44, 725 (1954).

459. Wyszecki, Günter A graphical interpretation of a three-components theory of chromatic adaptation in terms of the CIE chromaticity diagram. J. Opt. Soc. Amer. 44, 787 (1954).

460. Judd, Deane B. Summary of Symposium on color of transparent and translucent products. Bull. Amer. Soc. Test. Mater. Nos. 201 and 202 (Oct.-Dec. 1954).

461. Nickerson, D., Judd, D. B. and Wyszecki, G. Uber eine tranformation des normvalenz-systems in ein empfindungsgemass gleichabständiges system auf der grundlage des Munsell-Systems. Die Farbe 4, 285 (1955).

462. Keegan, Harry J. Evaluation of small color differences, Part II-spectrophotometric determinations. Bull. Amer. Ceram. Soc. 34, 23 (1955).

463. International Commission on Illumination, Report of (American) Secretariat Committee on Colorimetry. Proc., thirteenth session, Zurich

(June 1955). (DBJ).

464. Judd, Deane B.
Progress report by OSA committee on uniform color scales.
J. Opt. Soc. Amer. 45, 673 (1955); J. Illum. Eng. Soc. Japan 40, 8 (1956).

465. Judd, Deane B.
Radical changes in photometry and colorimetry foreshadowed by CIE actions in Zurich.
J. Opt. Soc. Amer. 45, 897 (1955).

465a. Kelly, K. L. and Judd, Deane B.
The ISCC-NBS method of designating colors and a dictionary of color names.
NBS Circ. 553 (Nov. 1955). Reprinted May 1, 1965.

466. Keegan, Harry J.
Safety color codes.
Mag. Stand. 27, 21 (1956).

467. Nimeroff, I., Hammond, H. K. III, Richmond, J. C. and Crandall, J. R.
Specular-gloss measurement of ceramic materials.
J. Amer. Ceram. Soc. 39, 103 (1956).

468. Judd, Deane B. and Wyszecki, Günter.
Extension of the Munsell renotation system to very dark colors.
J. Opt. Soc. Amer. 46, 281 (1956).

469. Helson, Harry, Judd, Deane B. and Wilson, Martha
Color rendition with fluorescent sources of illumination.
Illum. Eng. 51, 329 (1956).

469a. Judd, Deane B.
Un nuevo punto de vista en la medida de la luz y el color (A new point of view in the measurement of light and color). Anales de la Real Sociedad Espanola de Fisica y Quimica, Serie A-FISICA.
Tomo LIII (A), pag. 43. Nos. 1-2-Enero-Febrero 1957.

470. Nimeroff, I.
Two-parameter gloss methods.
J. Res. Nat. Bur. Stand. 58, 127 (1957) RP2774.

470a. Keegan, Harry J.
New Federal Standard on Colors.
J. Opt. Soc. Amer. 47, 330 (1957).

471. Hammond, Harry K. III
Gloss measurement-past, present and future.
Amer. Paint J. 41, 94 (1957).

472. Judd, Deane B.
Medida del color en la industria.
Boletin Iberoamericano de Cultura Technica 1, 13 (1957).

473. Nimeroff, Isadore
Propagation of errors in tristimulus colorimetry.
J. Opt. Soc. Amer. 47, 697 (1957).

475. Judd, Deane B.
Description of color.
Proc. of the Perkin Centennial, 1856-1956, p. 177, Ogden Printing Co., 1957.

476. Keegan, Harry J. and Schleter, John C.
Spectrophotometry and aerial reconnaisance.
J. Opt. Soc. Amer. 47, 1050 (1957). (Abstract).

477. Kelly, Kenneth L.
Observer differences in color-mixture functions studied by means of a pair of metameric grays.
J. Res. Nat. Bur. Stand. 60, 97 (1958) RP2825.

478. Judd, Deane B.
A new look at the ... Measurement of Light and Color.
Illum. Eng. 53, 61 (1958).

478a. Keegan, Harry J.
Colorimetry from precise spectrophotometry.
J. Opt. Soc. Amer. 48, 281 (1958). (Abstract).

478b. Nimeroff, I.
Review of Book The Measurement of Colour, 2nd Ed., by W. D. Wright, The Macmillan Co., New York, 1958.
Science 128, 585 (1958).

479. Keegan, H. J., et. al.
Digital reduction of spectrophotometric data to Munsell renotations.
J. Opt. Soc. Amer. 48, 863 (1958). (Abstract).

479a. Nimeroff, I. and Laufer, J. S.
Spectral band-pass determinations by a dynamic approach.
J. Opt. Soc. Amer. 48, 864 (1958). (Abstract).

480. Schleter, J. C., Judd, D. B. and Keegan, H. J.
Extension of the Munsell renotation system.
J. Opt. Soc. Amer. 48, 863 (1958). (Abstract).

480a. Gibson, Kasson S.
Review of Book The Measurement of Colour, 2nd Ed., by W. D. Wright.
Rev. Sci. Instrum. 29, 802 (1958).

481. Kelly, Kenneth L.
Central notations for the revised ISCC-NBS color-name blocks.
J. Res. Nat. Bur. Stand. 61, 427 (1958) RP2911.

482. Judd, Deane B.
Some color demonstrations I have shown.
J. Opt. Soc. Amer. 49, 322 (1959).

483. Hammond, Harry K. III
Color measurement and specification.
Paint, Oil Chem. Rev. 122, 6 (1959).

483a. Nimeroff, I.
Status of ASTM methods and standards for appearance evaluation. ASTM Special Technical Publication No. 258, Symposium on Visual Aids for Standardizing and Communicating Product Appearance, p. 3, 1959.

483b. Barbrow, Louis E.
Memorandum on a procedure for obtaining spectral radiant intensities of tungsten filament lamps, 400-700 mu.
J. Opt. Soc. Amer. 49, 1122 (1959).

483c. Keegan, H. J.
Color codes and the red-green confuser.
J. Opt. Soc. Amer. 49, 1136 (1959). (Abstract).

484. Judd, Deane B.
Appraisal of Land's work on two-primary color projections.
J. Opt. Soc. Amer. 50, 254 (1960); J. Photographic Science 8, 125 (1960).

485. Hammond, Harry K. III, Holford, Warren L. and Kuder, Milton L.
Ratio-recording spectroradiometer.
J. Res. Nat. Bur. Stand. 64C, 151 (1960).

486. Gibson, G. L., Hammond, H. K., Holford, W. L. and Nimeroff, Isadore.
Calibration of photometric devices.
J. Opt. Soc. Amer. 50, 508 (1960). (Abstract).

486a. Keegan, H. J.
Spectrophotometry 190 to 2500 mu.
J. Opt. Soc. Amer. 50, 508 (1960). (Abstract).

487. Reinboldt, W. C. and Menard, J. P.
Mechanized conversion of colorimetric data to Munsell renotations.
J. Opt. Soc. Amer. 50, 802 (1960).

488. Judd, Deane B.
A five-attribute system of describing visual appearance.
ASTM Spec. Tech. Pub. No. 297, Amer. Soc. for Test. Mater., Philadelphia 3, Pa. (July 1961).

488a. Kelly, Kenneth L.
Review of Book Farver i Farver by Dr. Andreas Kornerup and J. H. Wanscher. ISCC Newsletter 155, 19 (1961).

489. Judd, D. B.
Maxwell and modern colorimetry.
J. Photographic Science 9, 341 (1961).

490. Nimeroff, I., Rosenblatt, J. R. and Dannemiller, M. C.
Variability of spectral tristimulus values.
J. Res. Nat. Bur. Stand. 65A, 475 (1961); J. Opt. Soc. Amer. 52, 685 (1962).

491. Hammond, Harry K. III
Accuracy of spectroradiometric measurements.
J. Opt. Soc. Amer. 51, 1470 (1961). (Abstract).

492. Keegan, H. J., Schleter, J. C. and Weidner, V. R.
Ultraviolet wavelength standard for spectrophotometry.
J. Opt. Soc. Amer. 51, 1470 (1961). (Abstract).

493. Kelly, K. L.
Some problems of color identification.
J. Amer. Inst. Architects 37, 80 (1962); Proc. of Conf. of Building Research Institute, National Academy of Sciences - National Research Council, Nov. 1961. Publication 1001, Building Research Institute, 1962.

493a. Keegan, H. J.
Reflectance-surface color codes.
J. Opt. Soc. Amer. 52, 604 (1962). (Abstract).

494. Keegan, H. J., Schleter, J. C. and Judd, D. B.
Glass filters for checking performance of spectrophotometer-integrator systems of color measurement.
J. Res. Nat. Bur. Stand. 66A, 203 (1962).

495. Judd, D. B., Chamberlin, G. J. and Haupt, Geraldine W.
The ideal Lovibond color system.
J. Res. Nat. Bur. Stand. 66C, 121 (May-June 1962); J. Opt. Soc. Amer. 52, 813 (1962).

496. Judd, Deane B.
Blue-glass filters to approximate the blackbody at 6,500°K.
Die Farbe 10, 31 (1962).

497. Kelly, Kenneth L.
Coordinated color identifications for industry.
Nat. Bur. Stand. Tech. Note 152 (Nov. 1962).

497a. Howett, Gerald L.
Loci of discrepancy chromaticities for von Kries transformations.
J. Opt. Soc. Amer. 53, 510A (1963). (Abstract).

498. Keegan, H. J., Cleek, G. W., Schleter, J. C. and Weidner, V. R.
Absorption spectra of the lanthamide series of rare-earth glasses.
J. Opt. Soc. Amer. 53, 517 (1963). (Abstract).

499. Kelly, Kenneth L.
Lines of constant correlated color temperature based on MacAdam's (u,v) uniform chromaticity transformation of the CIE diagram.
J. Opt. Soc. Amer. 53, 999 (1963).

500. Emara, Sayeda H. and Teele, Ray P.
Development of filters for a thermo-electric colorimeter.
J. Res. Nat. Bur. Stand. 67C, 319 1963).

501. Hammond, Harry K., III.
Spectroradiometry by means of modified spectrophotometers.
Appl. Opt. 2, 1207 (1963). (Letter to Editor).

502. Keegan, H. J., Cleek, G. W., Schleter, J. C., Weidner, V. R. and Smith, Carol Ann.
Absorption spectra of the first transition series of phosphate glasses.
J. Opt. Soc. Amer. 53, 1353A (1963). (Abstract).

503. Keegan, H. J., Cleek, G. W., Schleter, J. C. and Wiedner, V. R.
Further progress toward development of a single filter for the wavelength calibration of spectrophotometers between 0.25 and 2.6u.
J. Opt. Soc. Amer. 53, 1353A (1963). (Abstract).

504. Keegan, Harry J., Schleter, John C. and Belknap, Marion A.
Recalibration of the NBS glass standards of spectral transmittance.
J. Res. Nat. Bur. Stand. 67A, 577 (1963).

505. Kelly, Kenneth L.
Review of Book The Natural System of Colours by Moses Harris (1766).
J. Opt. Soc. Amer. 54, 133 (1964). (534).

506. Hammond, Harry K., III.
Gloss standards and glossmeter standardization.
Off. Dig. 36, 343 (1964).

507. Judd, D. B. and Nimeroff, I.
Specification and designation of color, Chapter 57 of Treatise on Analytical Chemistry, Interscience Publishers, John Wiley & Sons, Part 1, Vol.5, 1964.

507a. Judd, D. B.
Studies of illuminating and viewing conditions in the colorimetry of reflecting materials.
Color Eng. 2, 14 (1964).

508. Nimeroff, I.
Field trial of the 1959 CIE supplementary standard observer proposal.
J. Opt. Soc. Amer. 54, 696 (1964).

509. Nimeroff, Isadore.
Colorimetry in parafoveal fields.
I. Color-matching functions.
J. Opt. Soc. Amer. 54, 824 (1964).

510. Nimeroff, Isadore.
Colorimetry in parafoveal fields.
II. Additivity failure.
J. Opt. Soc. Amer. 54, 833 (1964).

511. Nimeroff, I.
Review of Book The Measurement of Colour, 3rd Ed., by W. D. Wright, D. Van Nostrand, Co., Inc., New York, 1964.
Science 134, (1964).

512. Judd, Deane B., MacAdam, David L. and Wyszecki, Günter.
Spectral distribution of typical daylight as a function of correlated color temperature.
J. Opt. Soc. Amer. 54, 1031 (1964); also Illum. Eng. Soc. Tech. Transactions LX, 272 (1965).

513. Judd, Deane B.
Relation between normal trichromatic vision and dichromatic vision representing a reduced form of normal vision.
Acta Chromatica 1, 89 (1964).

514. Nimeroff, Isadore.
Spectral tristimulus values for the CIE (u,v,w) uniform spacing system.
J. Opt. Soc. Amer. 54, 1365 (1964).

515. Balcom, Margaret M.
Influence of red and blue preadaptation on hue matching of purple Munsell samples.
J. Opt. Soc. Amer. 54, 1397 (1964). (Abstract).

516. Gates, David M., Keegan, Harry J., Schleter, John C. and Weidner, V. R.
Spectral properties of plants.
Appl. Opt. 4, 11 (1965).

517. Nimeroff, I. and Yurow, J. A.
Degree of metamerism.
J. Opt. Soc. Amer. 55, 185 (1965).

517a. The ISCC-NBS Centroid Color Charts.
NBS Standard Sample #2106, Supplement to the Color Names Dictionary, NBS Circular 553, the ISCC-NBS Method of Designating Colors and a Dictionary of Color Names. See also NBS Tech. News Bulletin, p. 70 (May 1965). (Obtainable from the Office of Standard Reference Materials, National Bureau of Standards, Washington, D.C. 20234 for $9.00 per set of Charts). (KLK & DBJ).

518. Kelly, Kenneth L.
A Universal Color Language.
Color Eng. 3, 16 (1965).

519. Keegan, H. J., Schleter, J. C. and Weidner, V. R.
Infrared reflectance measurements, 2.5-22.2u.
J. Opt. Soc. Amer. 55, 607A (1965). (Abstract).

520. Kelly, Kenneth L. and Keegan, Harry J.
Revision of the ASA Safety Color Code, Z53.1-1953.
J. Opt. Soc. Amer. 55, 608A (1965). (Abstract).

521. Keegan, H. J., Schleter, J. C. and Nimeroff, I.
Photometric-scale calibration of spectrophotometers.
J. Opt. Soc. Amer. 55, 1580A (1965). (Abstract).

522. Kelly, Kenneth L.
Twenty-two colors of maximum contrast.
Color Eng. 3, 26 (1965).

523. Nimeroff, Isadore.
Comparison of uncertainty ellipses calculated from two spectrophotometric colorimetry methods by an automatic-computer program.
J. Opt. Soc. Amer. 56, 230 (1966).

524. Judd, Deane B.
Color designation and specification.
Encyclopedia of Industrial Chemical Analysis, pp. 315, 1966.

525. Takasaki, H.
Lightness change of grays induced by change in the reflectance of gray background.
J. Opt. Soc. Amer. 56, 504 (1966).

526. Keegan, Harry J. and Weidner, Victor R.
Infrared spectral reflectance of frost.
J. Opt. Soc. Amer. 56, 523 (1966).

527. Judd, Deane B.
Color, section in The Encyclopedia of Physics, edited by Robert M. Besancon, Reinhold Publishing Corp., New York, 1966.

528. Judd, Deane B.
Fundamental studies of color vision from 1860 to 1960.
Proceedings of the National Academy of Sciences 55, 1313 (1966).

529. Goebel, David G., Caldwell, B. Patrick and Hammond, Harry K., III.
Use of an auxiliary sphere with a spectroreflectometer to obtain absolute reflectance.
J. Opt. Soc. Amer. 56, 783 (1966).

530. Judd, Deane B.
Color Appearance.
Internationale Farbtagung, Luzern 1965, Vol. 1, p. 27; Musterschmidt-verlag, Göttingen, 1966.

531. Judd, Deane B.
Progress report for O.S.A. committee on uniform color scales.
Internationale Farbtagung, Luzern 1965, Vol. 1, p. 399; Musterschmidt-Verlag, Göttingen, 1966.

532. Keegan, Harry J. and Weidner, Victor R.
Infrared spectral reflectance of black materials.
J. Opt. Soc. Amer. 56, 1453A (1966). (Abstract).

533. Judd, Deane B.
Reflectance spectrophotometry.
Snell-Hilton Encyclopedia of Industrial Chemical Analysis, Vol. 3, John Wiley & Sons, Inc., New York, p. 376, 1966.

534. Kelly, Kenneth L.
Review of Book An Exposition of English Insects, with Curious Observations and Remarks by Moses Harris (1776). (506).
J. Opt. Soc. Amer. 56, 1786 (1966).

535. Judd, Deane B.
Physiological optics at the National Bureau of Standards.
Appl. Opt. 6, 13 (1967).

536. Takasaki, Hiroshi
Chromatic changes induced by changes in chromaticity of background of constant lightness.
J. Opt. Soc. Amer. 57, 93 (1967).

537. Goebel, David G.
Generalized integrating-sphere theory.
Appl. Opt. 6, 125 (1967).

538. Hammond, Harry K., III.
Review of Manual on Recommended Practices in Spectrophotometry.
Appl. Opt. 6, 173 (1967).

539. Judd, Deane B.
Review of Book Hermann von Helmholtz by Leo Koenigsberger.
Appl. Opt. 6, 174 (1967); also Physics Teacher, April 1967.

540. Judd, Deane B.
Interval scales, ratio scales, and additive scales for the sizes of differences perceived between members of a geodesic series of colors.
J. Opt. Soc. Amer. 57, 380 (1967).

541. Nimeroff, Isadore.
The variability of color measurement.
Color Eng. 5, 24 (1967).

542. Judd, Deane B.
Terms, definitions, and symbols in reflectometry.
J. Opt. Soc. Amer. 57, 445 (1967).

543. Kelly, K. L.
"Sand" to "Maize" to "Jasmine" to "Spanish Yellow".
J. Opt. Soc. Amer. 57, 703 (1967).

544. Kelly, Kenneth L.
Review of Book Principles of Color Technology by Fred W. Billmeyer and Max Saltzman.
Anal. Chem. 39, 67A (1967).

545. Judd, Deane B.
A flattery index for artificial illuminants.
Illum. Eng. XLII, 593 (1967).

546. U.S.A. Standards Institute, American Standard Safety Color Code for Marking Physical Hazards, Z53.1-1967, Approved Oct. 9, 1967. (HJK & KLK).

547. Nimeroff, I.
Review of Book Color Science by Wyszecki and Stiles.
Appl. Opt. 7, 85 (1968).

547a. Nimeroff, I.
Colorimetry.
National Bureau of Standards Monograph 104, Jan. 1968.

548. Caldwell, B. Patrick
Kubelka-Munk coefficients from transmittance.
J. Opt. Soc. Amer. 58, 755 (1968).

549. Kelly, Kenneth L.
Review of Book Color Science by Wyszecki and Stiles.
Phys. Today 21, 83 (1968).

550. Crawford, B. H. and Nimeroff, I.
Radiation sources and their power supplies, Chapter 2 of Techniques of photostimulation in biology, edited by B. H. Crawford, G. W. Granger and R. A. Weale, North-Holland Pub. Co., Amsterdam, Interscience Div. of John Wiley & Son, Inc., New York, 1968.

551. Howett, Gerald L.
Variation of absorptance-curve shape with changes in pigment concentration.
J. Res. Nat. Bur. Stand. 72A, 309 (1968).

552. Munis, R. H. and Finkel, M. W.
Goniometric measurements of infrared transmitting materials.
Appl. Opt. 7, 2001 (1968).

553. Judd, Deane B.
Color science and the paint industry.
J. Paint. Technol. 40, 470 (1968).

554. Nimeroff, I.
Metamerism and color-rendering indexes.
J. Opt. Soc. Amer. 58, 1557A (1968). (Abstract).

555. Nimeroff, Isadore.
A survey of papers on degree of metamerism.
Color Eng. 6, 44 (1968).

556. Judd, Deane B.
1964 CIE supplementary observer applied to the colorimetry of rutile and anatase forms of titanium dioxide.
J. Opt. Soc. Amer. 58, 1638 (1968).

556a. Judd, D. B.
Discussion of a paper by A. A. Eastman, Color contrast vs. luminance contrast.
Illum. Eng. 63, 618 (1968). (1964 CIE uniform color space extended to fields of small angular extent).

557. Nimeroff, I. and Schleter, J. C.
Professor Harry J. Keegan: Colorimetrists' Spectrophotometrist.
App. Opt. 8, 757 (1969).

558. Yonemura, G. T. and Kasuya, M.
Color discrimination under reduced angular subtense and luminance.
J. Opt. Soc. Amer. 59, 131 (1969).

558a. Yonemura, Gary T.
Report on literature review and recommendations on visual aspects of television viewing.
NBS Report 10466, Feb. 1969.

558b. Howett, Gerald L.
Perception of chromaticness differences among near-neutral colors.
J. Opt. Soc. Amer. 59, 503A (1969). (Abstract).

559. Nimeroff, I.
Review of Book Human Color Perception by J. J. Sheppard, American Elsevier, New York, 1968.
Physics Today 22, 81 (1969).

560. Nimeroff, I.
Review of Book The Rays are not Coloured by W. D. Wright (American Elsevier, New York, 1967).
Physics Today 22, 85 (1969).

561. Judd, Deane B.
Ideal color space.
Palette, No. 29 (1968), No. 30 (1968), No. 31 (1969). Published by Sandoz, Ltd., Dyestuffs/Chemical Div., CH-4002, Basle, Switzerland; also Color Eng. 8, 37 (1970).

562. Goebel, David G., Poole, Edward W. and Hartsock, Ronald G.
Instrument for measuring phototube spectral response.
Appl. Opt. 8, 1749 (1969).

563. Takasaki, Hiroshi
von Kries coefficient law applied to subjective color change induced by background color.
J. Opt. Soc. Amer. 59, 1370 (1969).

564. Nimeroff, I.
Color-match classifications assessed in terms of variable parameters.
J. Opt. Soc. Amer. 59, 1533A (1969). (Abstract).

564a. Judd, Deane B. and Yonemura, Gary T.
Target conspicuity and its dependence on color and angular subtense for gray and foliage green surrounds.
Unpublished NBS Report, Nov. 1969.

564b. Balcom, Margaret M.
Influence of red and blue pre-adaption on hue matching of purple samples.
J. Opt. Soc. Amer. 60, 118 (1970). (See 515).

565. Judd, Deane B. and Yonemura, Gary T.
CIE 1960 UCS diagram and the Müller theory of color vision.
J. Res. Nat. Bur. Stand. 74A, 23 (1970).

566. Nimeroff, I.
Metamerism index and color-difference index of metameric pairs.
J. Opt. Soc. Amer. 60, 733A (1970). (Abstract).

566a. Howett, Gerald L.
Achromatic-point prediction.
J. Opt. Soc. Amer. 60, 951 (1970).

567. Nimeroff, I.
The Deuteranopic convergence point.
J. Opt. Soc. Amer. 60, 966 (1970).

568. Judd, Deane B.
Introduction to Goethe's Theory of Colours (Eastlake), MIT Press 1970.
J. Opt. Soc. Amer. 60, 988 (1971).

569. Judd, D. B.
Review of Book Daylight and its Spectrum, by S. T. Henderson (American Elsevier Publishing Co., Inc., New York, 1970).
J. Opt. Soc. Amer. 60, 1296 (1970).

570. Yonemura, G. T.
Opponent-color-theory treatment of the CIE 1960 (u,v) diagram.
J. Opt. Soc. Amer. 60, 1407 (1970).

570a. Howett, Gerald L.
Chromaticness-difference scaling in the Munsell value 6/ plane.
J. Opt. Soc. Amer. 60, 1572A (1970). (Abstract).

571. Semmelroth, C. C.
The prediction of lightness and brightness on different backgrounds.
J. Opt. Soc. Amer. 60, 1685 (1970).

572. Judd, D. B. and Eastman, A.A.
Prediction of target visibility from the colors of target and surround.
Illum. Eng. 66, 256 (1971).

573. Semmelroth, C. C.
Adjustment of the Munsell-Value and W*-Scales to uniform lightness steps for various background reflectances.
Appl. Opt. 10, 14 (1971).

574. Nimeroff, I.
Psychology of color.
Amer. Paint J. 55, 65 (1971).

575. Nimeroff, I.
Color-match classification by variable parameters.
Color Eng. 9, 13 (1971). (See 564).

575a. Howett, Gerald L.
Scaling of perceived color differences near the limits of the matte-paint gamut.
J. Opt. Soc. Amer. 61, 688A (1971). (Abstract).

576. Judd, Deane B.
Choosing pleasant color combinations.
Lighting Design and Application 1, 31 (1971).

577. Nimeroff, I.
Review of Book Goethes' Color Theory (R. Mathaei) (Van Nostrand, Reinbold, N. Y. 1970).
J. Opt. Soc. Amer. 62, 465 (1972).

577a. Kohayakawa, Yoshimi
Contrast-difference thresholds with sinusoidal gratings.
J. Opt. Soc. Amer. 62, 584 (1972).

578. Nimeroff, I.
Instrumental Color Evaluation of Retroreflective Highway Sign Materials.
July, 1971, Rept. No. FHWA RD-1071-1.
NTIS, PB 204,586-Springfield, Va. 22151. (1972).

579. Nimeroff, I.
Editor, Precision Measurement and Calibration.
Colorimetry (includes 43 papers on this subject), NBS SP300, 9, 460 pages (June 1972).

580. Nimeroff, I.
Does the U*V*W* have a spectrum locus?
In Color Metrics, AIC Holland, eds. J. J. Vos, L.E.C. Friele and P. L. Walraven, p. 193 (1972).

581. Howett, Gerald L.
Legibility, esthetics, and page size.
Unpublished NBS Report, Sept. 1972.

582. Judd, D. B.
Color in Visual Signaling.
Proceedings NAS-Nat. Res. Council Symposium on Color Vision, The Spring Meeting 1971. Obtainable from Printing and Publishing Office, Nat. Acad. Sci., 2101 Constitution Ave., N.W., Washington, D.C. 20418, January 1973 (1972 Newton Lecture British Colour Group).

11. AUTHOR INDEX

NBS-114A (REV. 7-73)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. NBS-SP-393	2. Gov't Accession No.	3. Recipient's Accession No.

4. TITLE AND SUBTITLE

Colorimetry and Spectrophotometry: A Bibliography of NBS Publications January 1906 Through January 1973

5. Publication Date: April 1974

6. Performing Organization Code

7. AUTHOR(S)

Kenneth L. Kelly

8. Performing Organ. Report No.

9. PERFORMING ORGANIZATION NAME AND ADDRESS

NATIONAL BUREAU OF STANDARDS
DEPARTMENT OF COMMERCE
WASHINGTON, D.C. 20234

10. Project/Task/Work Unit No.

11. Contract/Grant No.

12. Sponsoring Organization Name and Complete Address *(Street, City, State, ZIP)*

Same as Number 9.

13. Type of Report & Period Covered: Final

14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

Library of Congress Catalog Card Number: 74-5090

16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

This bibliography of publications will serve as the key to the large amount of research into color measurement and specification, and color vision carried out by the staff of the National Bureau of Standards (NBS) in colorimetry and spectrophotometry. These 623 publications appeared in NBS publications and outside scientific and technical journals between January 1906 and January 1973. This material has been in constant demand by Bureau members as well as by outside individuals and organizations. The practical value of this wealth of information lies in its ready accessibility to the scientific and technical fraternity by title, by key words or by author, in the Library of Congress and in depository libraries such as large public and university libraries. A short organizational chronology of the colorimetry and spectrophotometry program is included.

17. KEY WORDS *(six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons)*

Bibliography; color; color codes; color measurement; colorimetry; spectrophotometry; vision.

18. AVAILABILITY

☐ Unlimited

☐ For Official Distribution. Do Not Release to NTIS

☒ Order From Sup. of Doc., U.S. Government Printing Office Washington, D.C. 20402, SD Cat. No. C13.10:393) —

☐ Order From National Technical Information Service (NTIS) Springfield, Virginia 22151

19. SECURITY CLASS (THIS REPORT): UNCLASSIFIED

20. SECURITY CLASS (THIS PAGE): UNCLASSIFIED

21. NO. OF PAGES: 54

22. Price: 95¢

USCOMM-DC 29042-P74

NBS TECHNICAL PUBLICATIONS

PERIODICALS

JOURNAL OF RESEARCH reports National urcau of Standards research and development in hysics, mathematics, and chemistry. Comprehensive cientific papers give complete details of the work, ncluding laboratory data, experimental procedures, nd theoretical and mathematical analyses. Illustrated ith photographs, drawings, and charts. Includes stings of other NBS papers as issued.

ublished in two sections, available separately:

Physics and Chemistry (Section A)

apers of interest primarily to scientists working in hese fields. This section covers a broad range of hysical and chemical research, with major emphasis n standards of physical measurement, fundamental onstants, and properties of matter. Issued six times year. Annual subscription: Domestic, $17.00; Forign, $21.25.

Mathematical Sciences (Section B)

tudies and compilations designed mainly for the nathematician and theoretical physicist. Topics in nathematical statistics, theory of experiment design, umerical analysis, theoretical physics and chemistry, ogical design and programming of computers and omputer systems. Short numerical tables. Issued quarerly. Annual subscription: Domestic, $9.00; Foreign, 11.25.

DIMENSIONS, NBS

he best single source of information concerning the ureau's measurement, research, developmental, coperative, and publication activities, this monthly ublication is designed for the layman and also for he industry-oriented individual whose daily work nvolves intimate contact with science and technology *—for engineers, chemists, physicists, research manrgers, product-development managers, and company xecutives.* Annual subscription: Domestic, $6.50; Forign, $8.25.

NONPERIODICALS

Applied Mathematics Series. Mathematical tables, manuals, and studies.

Building Science Series. Research results, test methods, and performance criteria of building materials, components, systems, and structures.

Handbooks. Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications. Proceedings of NBS conferences, bibliographies, annual reports, wall charts, pamphlets, etc.

Monographs. Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

National Standard Reference Data Series. NSRDS provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated.

Product Standards. Provide requirements for sizes, types, quality, and methods for testing various industrial products. These standards are developed cooperatively with interested Government and industry groups and provide the basis for common understanding of product characteristics for both buyers and sellers. Their use is voluntary.

Technical Notes. This series consists of communications and reports (covering both other-agency and NBS-sponsored work) of limited or transitory interest.

Federal Information Processing Standards Publications. This series is the official publication within the Federal Government for information on standards adopted and promulgated under the Public Law 89–306, and Bureau of the Budget Circular A–86 entitled, Standardization of Data Elements and Codes in Data Systems.

Consumer Information Series. Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

BIBLIOGRAPHIC SUBSCRIPTION SERVICES

The following current-awareness and literature-survey bibliographies are issued periodically by the Bureau:

Cryogenic Data Center Current Awareness Service (Publications and Reports of Interest in Cryogenics). A literature survey issued weekly. Annual subscription: Domestic, $20.00; foreign, $25.00.

Liquefied Natural Gas. A literature survey issued quarterly. Annual subscription: $20.00.

Superconducting Devices and Materials. A literature survey issued quarterly. Annual subscription: $20.00. Send subscription orders and remittances for the preceding bibliographic services to the U.S. Department of Commerce, National Technical Information Service, Springfield, Va. 22151.

Electromagnetic Metrology Current Awareness Service (Abstracts of Selected Articles on Measurement Techniques and Standards of Electromagnetic Quantities from D-C to Millimeter-Wave Frequencies). Issued monthly. Annual subscription: $100.00 (Special rates for multi-subscriptions). Send subscription order and remittance to the Electromagnetic Metrology Information Center, Electromagnetics Division, National Bureau of Standards, Boulder, Colo. 80302.

Order NBS publications (except Bibliographic Subscription Services) from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

OFFICIAL BUSINESS

Penalty for Private Use, $300

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM-215

U.S.MAIL

AMERICAN REVOLUTION BICENTENNIAL
1776-1976