



ISBN 3 900 734 19 4

COMMISSION INTERNATIONALE DE L'ÉCLAIRAGE
INTERNATIONAL COMMISSION ON ILLUMINATION
INTERNATIONALE BELEUCHTUNGSKOMMISSION

HISTORY OF THE CIE

1913 - 1988

Publication: CIE 82 - 1990

UDC: 628.9(09)
535.24(09)
535.65(09)

Descriptors: Lighting, Illuminating Engineering
Photometry
Colorimetry



Documents
Document Sharing Hub

HISTORY OF THE CIE

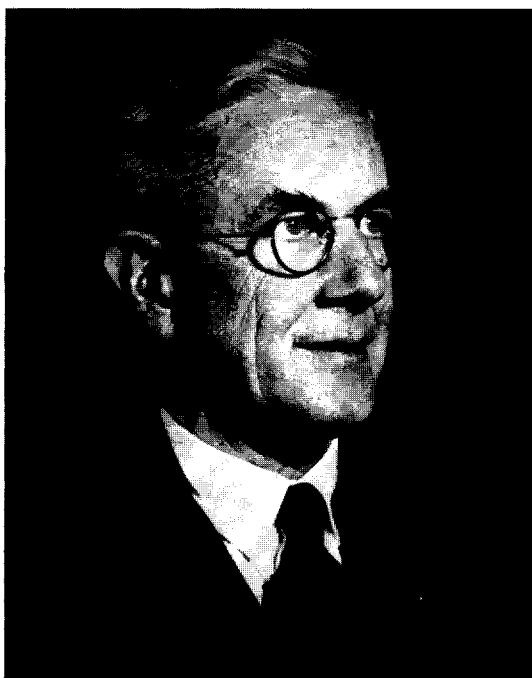
1913 – 1988

PREFACE

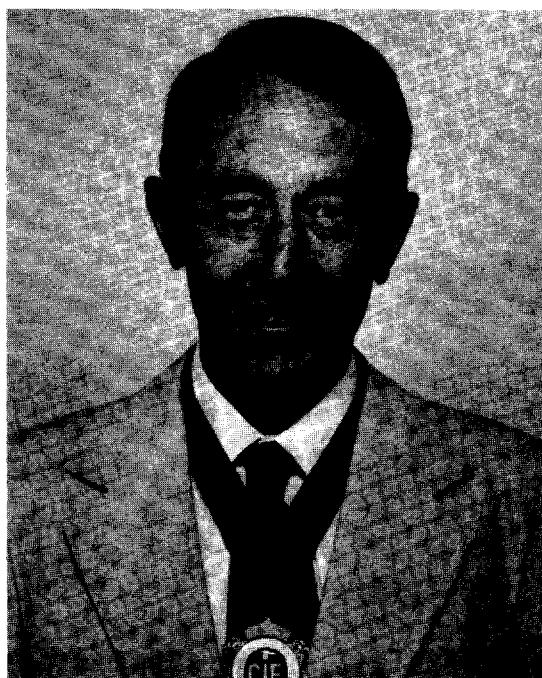
The Commission Internationale de l'Eclairage is indebted to the two authors whose work has been combined to provide this new edition of the CIE History. Both have given long and distinguished service to the Commission which ensures excellent qualification for the task they separately undertook.

We can, with confidence, repeat the words which appeared in the 1963 edition:

"We may be sure that the following pages ... are a faithful and detailed account of what has been achieved by the CIE."



Dr. J W T Walsh, GBR
President: 1955-1959



Dr. A M Marsden, HKG
President: 1985-1987

CONTENTS

The Photometric Commission	1
Zurich 1903	2
Zurich 1907	2
Zurich 1911	3
An Illumination Commission	4
Berlin 1913	4
Paris 1921	7
Geneva 1924	8
Bellagio 1927 and Saranac Inn 1928	10
Cambridge 1931	14
Berlin and Karlsruhe 1935	17
1935 - 1939	17
Scheveningen 1939	18
1939 - 1948	21
Paris 1948	22
1948 - 1951	25
Stockholm 1951	25
1951 - 1955	26
Zurich 1955	26
1955 - 1959	29
Brussels 1959	30
1959 - 1963	33
Vienna 1963	33
1963 - 1967	34
Washington 1967	37
1967 - 1971	37
Barcelona 1971	38
1971 - 1975	43
London 1975	44
1975 - 1979	44
Kyoto 1979	49
1979 - 1983	50
Amsterdam 1983	53
1983 - 1987	54
Venice 1987	54
Postscript	59
Appendix 1 Officers of the CIE	61
Appendix 2 Recorded Representation at CIE Sessions	64
Appendix 3 CIE Publication Activity	67
Appendix 4 Growth of CIE	70
Index Text	71
Index Names identified in 'Delegation Leaders' pictures	75

LIST OF ILLUSTRATIONS

Dr. J W T Walsh	1
Dr. A M Marsden	1
Delegates Signatures - Berlin 1913	5
Prof. T Vautier	6
Dr. E P Hyde	6
Visit to the Edison Laboratories	11
Delegation Leaders - Cambridge 1931	12
Sir Clifford C Paterson	15
Dr. A R Meyer	15
Delegates - Berlin 1935	15
Prof. C Fabry	16
Delegation Leaders - Berlin 1935	16
Delegation Leaders - Scheveningen 1939	19
Delegation Leaders - Paris 1948	20
Prof. Dr. N A Halbertsma	20
Social events - Paris 1948	23
Royal Visitor - Stockholm 1951	24
Dr. W Harrison	24
Banquet - Stockholm 1951	27
Delegation Leaders- Zurich 1955	28
Delegation Leaders- Brussels 1959	31
Executive Committee - Brussels 1959	32
Mr. I Folcker	32
Prof. L Schneider	32
Delegation Leaders- Vienna 1963	35
Plenary Session - Vienna	36
Delegation Leaders - Washington 1967	39
Dr. D Vermeulen	40
Mr. W R Stevens	40
Delegation Leaders- Barcelona 1971	41
Delegates - Barcelona	42
Delegation Leaders- London 1975	45
Dr. S K Guth	46
Banquet - London	46
Delegation Leaders - Kyoto 1979	47
High-level matters - Kyoto	48
Action Committee - Warsaw 1980	48
Delegation Leaders - Amsterdam 1983	51
Prof. J B de Boer	52
Social event - Amsterdam	52
Delegation Leaders - Venice 1987	55
Dr. G Wyszecski	56
Prof. Dr. H W Bodmann	56
Central Bureau - Vienna 1987	57
75th Anniversary - Ettlingen 1988	58

IV

FOREWORD

In 1963, the history of the first 50 years of the CIE together with the 13 years of its predecessor, the CIP, appeared as Publication CIE 9. This is now out of print. In the issue of the CIE Journal celebrating the 75th birthday of the CIE (Vol. 7/2, 1988) there appeared an article covering the history of the CIE from 1959 to 1988.

This document, designated Publication CIE 82, is essentially a merger of the original CIE 9 with the 1988 Journal article, to provide a complete history of the first 75 years of the CIE. The editing of the two components has been kept to the minimum to preserve as much of the original material as possible while retaining consistency between the text and the new appendices. These appendices seek to give an accurate statistical record of CIE officers, membership, participation, and publication over the whole period - not an easy task when there are gaps in the records of the early years and when there have been changes in national boundaries associated with two world wars. Any errors which come to light in this document should be laid at the door of the new author, Dr. A M Marsden, and not at that of the original CIE historian Dr. J W T Walsh.

AVANT PROPOS

En 1963, l'historique des cinquante premières années de la CIE, et celle des treize années de la CIP (Commission Internationale de Photométrie) qui l'avait précédée, avaient fait l'objet de la Publication CIE n° 9. Cette Publication est maintenant épuisée. Dans le numéro du CIE Journal consacré à la célébration du soixante quinzième anniversaire de la CIE (vol. 7, n° 2, 1988), on a fait paraître un article retraçant l'histoire de la CIE de 1959 à 1988.

Le présent document, Publication CIE n° 82, est essentiellement la fusion de la Publication CIE n° 9 et de l'article du CIE Journal de 1988, pour donner un historique complet des soixante quinze premières années de la CIE.

Les aménagements rendus nécessaires par la publication conjointe de ces deux textes ont été limités au minimum afin de préserver autant que possible les documents d'origine tout en respectant la cohérence entre le texte et les nouvelles annexes.

Ces annexes cherchent à donner une revue précise des personnalités officielles, des participations et des publications de la CIE, pendant toute cette période - tâche qui n'a pas été rendue facile par les lacunes dans les enregistrements et par les modifications de frontières entre états dues aux deux guerres mondiales. Toutes les erreurs qui pourraient être mises en lumière dans ce document, devront être attribuées au nouvel auteur, le Dr. A M Marsden, et non au premier historien de la CIE, le Dr. J W T Walsh.

VORWORT

Im Jahre 1963 erschien die Geschichte der ersten 50 Jahre der CIE einschließlich der 13 Jahre ihrer Vorgängerin, der CIP, als CIE Publikation No. 9. Diese Publikation ist inzwischen vergriffen. In der Jubiläumsausgabe des CIE Journals anlässlich des 75sten Geburtstages der CIE (Vol. 7/2, 1988) erschien ein Artikel, der die darauffolgende Geschichte von 1959 bis 1988 darstellte.

Das vorliegende Dokument, das als CIE Publikation No. 82 herausgegeben wird, ist eine Zusammenfassung der ursprünglichen Publikation CIE No. 9 mit dem im oben erwähnten CIE Journal erschienenen Artikel und gibt die komplette Geschichte der ersten 75 Jahre der CIE wieder. Die Bearbeitung beider Dokumente wurde auf ein Minimum reduziert, um einerseits möglichst viel vom Originalmaterial zu erhalten, andererseits aber eine möglichst gute Übereinstimmung zwischen dem Text und den neuen Anhängen zu gewährleisten. Diese Anhänge versuchen eine genaue statistische Aufzählung der CIE Vorstandsmitglieder, Mitgliedschaften, Tagungsteilnehmerlisten und Publikationen über die ganze Zeitperiode zu geben. Dies war keine leichte Aufgabe, da in den Aufzeichnungen der ersten Jahre Lücken bestanden und nationale Ländergrenzen sich infolge zweier Weltkriege änderten. Für etwaige noch vorhandene Fehler ist der neue Autor, Dr. A M Marsden und nicht mehr Dr. J W T Walsh, der Autor der originalen Historie verantwortlich.

THE PHOTOMETRIC COMMISSION

Although the Commission Internationale de l'Eclairage was born in 1913, the numbering of its Sessions has always included those of its predecessor, the Commission Internationale de Photométrie. It is therefore appropriate that this history should begin with some account of the foundation of the CIP and its activities before it was enlarged in scope and membership to form the present Commission.

The first steps towards the formation of an international body concerned with light measurement were taken at the International Gas Congress, held during the Paris Exhibition of 1900. On 3 September some 400 gas engineers and others gathered in the Palais des Congrès at the Exhibition, under the chairmanship of Prof. T Vautier, the then President of the Société Technique de l'Industrie du Gaz de France. During the course of his opening address Prof. Vautier referred to the desirability of having some general agreement on methods of measuring the light given by incandescent gas lamps and in the discussion which followed a paper on "The Photometry of Incandescent Gas Mantles", read at the opening meeting of the Congress, he proposed the following resolution:

"Le Congrès International de l'Industrie du Gaz, considérant qu'il est de l'intérêt général et commun des producteurs aussi bien que des consommateurs de gaz d'être exactement renseignés sur le pouvoir éclairant des becs employés pour l'éclairage à incandescence, décide:

Une Commission internationale sera nommée à l'effet de fixer les règles à suivre dans les observations photométriques des becs à incandescence par le gaz;

Le Bureau du Congrès est chargé de procéder à l'organisation de cette Commission internationale."

This resolution was adopted unanimously and on the following afternoon Prof. Vautier announced that the Bureau of the Congress had met and, acting on the resolution, had decided on the constitution of the new Commission. It would consist of four members from France, four from Germany and four from Great Britain with one member from each of the following countries: Austria-Hungary, Belgium, Italy, the Netherlands, Switzerland and the United States of America. The offices were to be at the headquarters of the French Society, Prof. T Vautier and P Delahaye (Secretary of the Congress) were nominated as President and Secretary respectively and it was proposed that the first meeting should be held at Zurich, although no date was fixed. These proposals were adopted unanimously by the Congress and thus the Commission Internationale de Photométrie was founded. At a subsequent meeting of the Congress the unification of screw-threads used in gas engineering was considered and it was resolved that this matter, too, should be referred to the newly appointed Commission.

ZURICH 1903

It will be seen that the original CIP, unlike the CIE of today, was a body of very restricted membership, with a severely limited programme of work. Its first Session was held at the Zurich Polytechnikum from 19 to 22 June 1903, when 13 of the appointed members (including the officers) and one co-opted member were present. Five papers were presented by their authors, one of them dealing with the relative luminous intensities of the various flame standards then in use. The discussion on this paper led to a recommendation that there should be further comparisons of the Carcel, Hefner and (10 candle) Vernon Harcourt lamps, with the aim of fixing the relative values of the units based on these standards.

At this first Session the Commission approved a lengthy programme of work, one item being the establishment of detailed rules for the photometry of incandescent gas lamps. The subject of the unification of screw-threads was referred to a committee.

The records of this and subsequent Sessions, under the title "Recueil des Travaux et Compte Rendu des Séances", were published by the Société Technique de l'Industrie du Gaz. They were in the French language throughout, but it was agreed that editions in English and German might be published by the corresponding technical societies. In fact, an English version was published by the Institution of Gas Engineers in 1906 and this was reproduced by the American Gas Institute in 1911. Both this and a German version published in the Journal für Gasbeleuchtung for 1903 contained translations of the papers presented at the meetings. (For the subsequent Sessions in 1907 and 1911, translations were published in the pages of the leading gas journals in England and in Germany, the English version being reproduced in the Proceedings of the American Gas Institute for 1911.)

The costs of the Session were defrayed by the different national gas societies in amount proportional to the numbers of their representatives.

ZURICH 1907

At the end of the 1903 Session it was decided that the Commission should meet again as soon as the work agreed upon had been completed, or in two years time at the latest, but in fact the second Session was not held until 1907. This time the venue was the Hotel Bellevue in Zurich and the meetings were held there from 18 to 20 July. There had been several changes in membership owing to death or resignation and those present numbered one less than in 1903. In addition, however, there were representatives appointed by the national laboratories of France, Germany and Great Britain. These were respectively F Laporte, E Brodhun and C C Paterson. It is noticeable that this extension of membership was the direct result of the decision taken in 1903 to initiate a comparison between the various flame standards. Of the six papers presented at the second Session no less than three, one from each of the countries with a national laboratory, described such comparisons and it was obvious that this subject was the most important item on the Commission's programme. To prosecute the work more effectively a committee, consisting of the President with F Laporte, E Brodhun and C C Paterson, was given the task of fixing the ratios between the units derived from the different flame standards when used under normal atmospheric conditions.

A possible alternative to the flame standards was the Violle standard, proposed in 1881. This depended on the use of platinum at its melting point and a resolution was passed instructing the Bureau of the Commission to approach the national laboratories with a request that they should study the constancy of the melting point of platinum because of its importance in photometry.

Among the other matters of interest raised during discussions at this Session of the CIP was the measurement of mean spherical candle-power. It was reported that the use of the Ulbricht sphere for this purpose was being studied, both at the Physikalisch-technische Reichsanstalt in Charlottenburg and at the Laboratoire Central d'Electricité in Paris. It was at this Session, too, that the growing interest of the electrical industry in the photometry of light sources was first mentioned.

Reference should be made here to work which was going on at this time with the object of reconciling the different photometric units employed in different parts of the world. Carbon filament electric lamps were used for a series of international comparisons carried out by the national laboratories and as the outcome of these measurements the laboratories of France, Great Britain and the USA announced that from 1 July 1909, the American candle, the British candle and the French bougie décimale would all have the same value. It was added that the value of the Hefnerkerze could be taken as nine-tenth of this common unit. Although this agreement was sponsored by the national laboratories and not by the CIP, there is no doubt that it was facilitated by the work on the different flame standards that had been fostered by and reported to the Commission.

ZURICH 1911

The third Session of the CIP was held from 26 to 29 July 1911, once more at the Zurich Polytechnikum. On this occasion 14 members were present but this number did not include the recently appointed representative of USA, Dr. E P Hyde, who had taken a very active part in the work leading to the agreement of 1909 mentioned above. This agreement was now officially endorsed by the Commission.

As at previous Sessions a number of papers were presented, one of them describing research into the effect of atmospheric conditions on the Hefner and pentane lamps, others describing the effects of various factors on the light output from incandescent gas lamps. It was at this Session that the Commission, as the result of reports of investigations carried out over a number of years, recommended that the test of illuminating power applied to gas should be replaced by a measurement of its calorific value.

A short paper, of great interest in the light of present-day developments in photometric standards, was presented by H Strache of Austria-Hungary. He pointed out that if the radiation from a source were weighted in accordance with the sensitivity of the eye - and here he referred to the dispersion-and-mask method of doing this - its measurement in absolute units was, in effect, a measurement of the light from the source. He remarked that it would be necessary to determine the mean sensitivity curve of the eye and thus foreshadowed the establishment of the $V(\lambda)$ curve by the CIE in 1924. The proposals in this paper were referred to a committee for further study. Another committee was set up to study proposals for the establishment of an international system of photometric quantities and their units.

At this Session two meetings were devoted to matters of organization. In particular it was decided that the future membership of the Commission should comprise up to 6 nominees from each of the technical gas societies of France, Germany and Great Britain, with 2 from each of the other countries represented at the time. Voting would be by countries and decisions would require an affirmative vote from four-fifths of the countries voting.

A further significant step was taken when it was decided to ask the National Electrotechnical Committees of the different countries to nominate members, two each from France, Germany and Great Britain and one from each of the other countries. This extension of the membership was recognition of a growing feeling that the scope of the Commission's work should be widened to include all aspects of lighting.

AN ILLUMINATION COMMISSION

The new technology of illuminating engineering was developing rapidly and societies had been formed to foster its progress, first in the USA in 1906, in Great Britain three years later and in Germany in 1912. The measurement of light sources was now becoming only part of a much wider activity, the study of how to use to the best advantage the light which these sources provided.

Only a few weeks after the third Session of the CIP, the matter was raised at the International Electrical Congress held in Turin from 10 to 16 September 1911, and as the result of a proposition by Leon Gaster (representing the British Illuminating Engineering Society), the following resolution was passed unanimously :

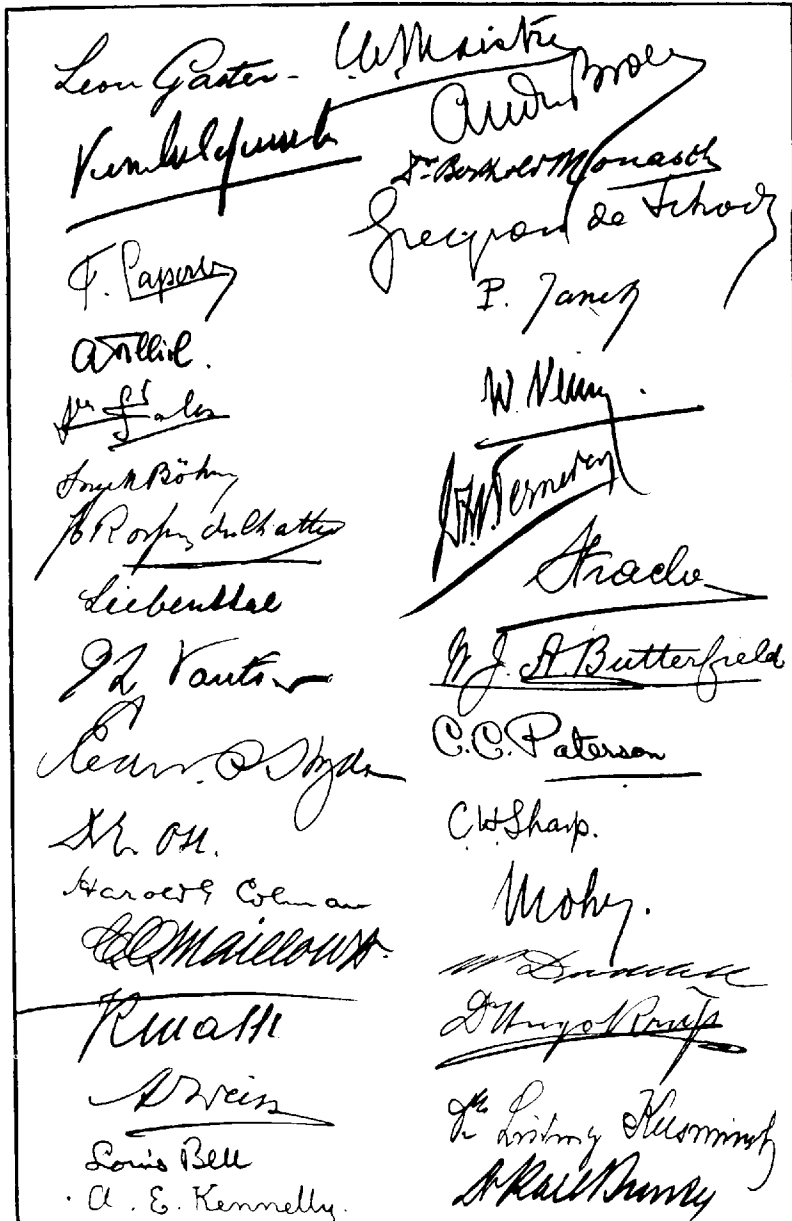
"Il Congresso crede che sia desiderabile che sia nominata una Commissione Internazionale per lo studio di tutti i sistemi di illuminazione e di tutti i problemi tecnici che interessano la illuminazione, e, presa notizia del fatto che la "Illuminating Engineering Society" di Londra intende di formare una tale Commissione internazionale, mettendosi perciò in relazione con tutte le altre Commissioni fotometriche nazionali e internazionali già esistenti, approva l'iniziativa."

The various decisions on organization, made by the CIP in 1911 as mentioned above, required ratification by the gas societies in the different countries and in January 1912 the President wrote to each society for its approval. The reply from the American Gas Institute suggested a broadening of the basis of the Commission's activities and this reply was carried personally to Prof. Vautier by Dr. Hyde who took the opportunity to visit several countries and obtain the views of those most interested in the matter in Great Britain, Germany and the Netherlands, as well as in France. He found general agreement that the proposed widening of the Commission's scope was desirable and the outcome was a reply, in June 1912, from Prof. Vautier to the American society, agreeing in principle with their proposals. The task of working out, with him, a fresh constitution for the Commission was entrusted to the committee which had been appointed in 1911 to study proposals for systematizing the photometric quantities and units. This committee consisted of E Brodhun, E P Hyde, L Kusminsky, F Laporte and C C Paterson, but as Dr. Hyde had played such an active part in initiating the move towards reorganization, he felt that it would be better for someone less committed to take his place. He therefore resigned from the committee and E B Rosa was appointed to replace him.

BERLIN 1913

The committee, with C C Paterson as secretary, worked quickly and draft Statutes for a much enlarged Commission, to be called the Commission Internationale de l'Eclairage, were ready for consideration by the delegates to the fourth Session of the CIP held in Berlin from 27 to 30 August 1913, under the presidency of Prof. Vautier. The whole of the Session was devoted to a discussion of this draft and a number of amendments to it were made. The business was entirely non-technical and the records were never printed, a fact which has sometimes led to enquiries from zealous librarians worried by an apparent lacuna on their shelves. A large number of copies in the French language was, however, reproduced in mimeographed form and the Statutes themselves, as finally agreed, were printed in Lyons in 1923, long after the first meeting of the new Commission. They were given the operative date of September 1913.

These Statutes changed completely the structure of the Commission. No longer was it to consist of a small number of nominees of the technical societies concerned with gas engineering in each country. Instead, any country which wished to participate in the work of the Commission and be represented at its meetings could do this only by forming a National Committee which was truly



Leon Gaster - U. Maistre
 Kunkelmann
 F. Papas
 Anttila
 Dr. J. S. S.
 J. R. Böhm
 R. R. P. S. S. S.
 Liebenthal
 J. A. Vauter
 A. Carr. S. S. S.
 M. O. H.
 H. R. S. S. S.
 H. M. S. S. S.
 R. M. S. S. S.
 S. S. S.
 Louis Bell
 A. E. Kennelly.

Auditor
 J. R. S. S. S.
 P. J. S. S.
 W. S. S.
 J. S. S.
 S. S. S.
 H. J. S. S. S.
 C. C. S. S.
 C. S. S.
 M. S. S.
 S. S. S.
 S. S. S.
 S. S. S.
 S. S. S.

An interesting memento of the historic occasion in Berlin 1913.

Facsimile of signatures of delegates on the menu of the dinner given at the Esplanade Hotel during the Congress.



Prof. T Vautier, FRA
President: 1900-1913 CIP, 1913-1921



Dr. E P Hyde, USA
President: 1921-1927

representative of all the bodies in that country with a strong technical interest in lighting. This Committee was responsible for selecting its country's delegation to Sessions of the Commission and for providing that country's contribution to the Commission's expenses. The National Committees were, in fact, the channels through which lighting engineers in the different member countries could come together for mutual discussion and, where appropriate, make recommendations which had behind them the force of international agreement.

Responsibility for the day-to-day conduct of the Commission's affairs was entrusted to a Bureau consisting of the chief officers, acting under the general supervision of an Executive Committee, the body of which was composed of two representatives of each member country. The Honorary Secretary was to be assisted by a paid General Secretary whom he appointed subject to the approval of the Executive Committee.

Three languages, French, English and German, were recognized for use at meetings, although French remained the language in which all official decisions were to be expressed. Other statutes dealt with the organization of the Sessions, with financial arrangements and the like. The title proposed in the draft was adopted and the object was stated as follows :

"La Commission a pour objet d'étudier toutes les questions ayant trait à l'industrie de l'Eclairage et aux Sciences qui s'y rapportent, et d'établir, par tous moyens appropriés, des ententes internationales sur les questions d'éclairage."

The number of delegates present at Berlin in 1913 was 45. A full list of the delegates is given in the brochure containing the Statutes which, as noted earlier, was printed in 1923.

At the last meeting of the Session the officers of the new Commission were elected - T Vautier (France) as President, H Bunte (Germany), E P Hyde (USA) and L Kusminsky (Austria) as Vice-Presidents, C C Paterson (Great Britain) as Honorary Secretary.

It was agreed that the offices of the Commission should be located in the country of the Honorary Secretary, i.e. then in Great Britain, that each member country should contribute the sum of 1250 francs to the funds of the Commission and that the salary paid to the General Secretary should not exceed 5000 francs per annum. Finally it was decided that the next Session should be held in Paris and, in accordance with the new statutes which called for a Session every three years, that it should take place in 1916, but unfortunately this was not to be.

There is nothing further to record after 1913. A General Secretary was appointed, but the outbreak of the first world war came soon afterwards and the appointment was terminated because it was clear that the work of the Commission would have to be suspended until the cessation of hostilities.

PARIS 1921

In the spring of 1920 Dr. Hyde again visited Europe to explore the possibility of re-starting the Commission's activities and found general support for the suggestion that a Session should be held in 1921. The Honorary Secretary, accompanied by the new General Secretary appointed soon after the end of the war, then went to Paris to discuss with members of the Comité National Français de l'Eclairage the arrangements to be made for holding the meetings at the headquarters of the Société du Gaz, 6 rue Condorcet. On 5 July 1921, the fifth Session was opened by M Le Trocquer, Ministre des Travaux Publics, the chair being taken at all meetings by the President, Prof. Vautier.

Of the former CIP member countries only Belgium, France, Great Britain, Italy, Switzerland and USA were represented, but a delegate from Spain attended the meetings and took part in the proceedings. At the final plenary meeting of the Session a modification of the statutes was approved, with the object of facilitating the entry of new countries where it was difficult to comply fully with the rather detailed requirements for membership of a National Committee, as laid down in 1913.

The total number of delegates present in Paris was 24, including the officers, and 19 papers and other communications were presented either by organizations or by individuals in the different member countries. Seven of these dealt with units and standards or with definitions, and six others with heterochromatic photometry or the definition of the "standard eye". The remaining six were concerned with lighting practice.

At the final plenary meeting on 7 July, besides the amendment to the statutes noted above, and the establishment of the rate of contribution from the different countries (£ 2.5 sterling per million of inhabitants, with limits of £ 25 and £ 200), a number of study committees were appointed to work in the interval before the next Session which, according to the statutes, should be held in 1924. These committees were to deal with the following subjects :

- (a) Heterochromatic photometry.
- (b) Definitions and symbols.
- (c) Lighting in factories and schools.
- (d) Automobile headlights.

Definitions were adopted for the three fundamental quantities, luminous flux, illumination and luminous intensity, and for their units. The unit of luminous intensity was named the "bougie internationale" and its value was that used by the national laboratories of France, Great Britain and USA since 1909. This unit and its name were never adopted in Germany, which was not represented at the 1921 Session of the CIE.

Prof. Vautier having expressed his wish to relinquish the presidency, Dr. Hyde was appointed President in his place. Three Vice-Presidents were appointed, viz. F Rouland (France), G Semenza (Italy) and K Edgcumbe (Great Britain). The first Treasurer, A Weiss, had died during the war and at the President's request the Hon. Secretary had acted also as Treasurer for the time being. This arrangement was continued and in fact C C Paterson remained both Hon. Secretary and Treasurer until 1928. Prof. Vautier was elected the first Honorary President of the Commission and he continued to hold this office until his death in 1930.

The Proceedings of this Session were published in 1923 under the same title as that used for the Proceedings of the CIP, "Recueil des Travaux et Compte Rendu des Séances", the French language being employed throughout as before.

GENEVA 1924

At Paris it had been decided that the 1924 Session should be held in America but the proviso was added that, should circumstances make this inadvisable, the Executive Committee might alter the venue. The wisdom of this arrangement became apparent in due course and in fact for its sixth Session the Commission returned to Switzerland, although not to Zurich. The meetings were held in the Palais Eynard at Geneva from 22 to 25 July, under the presidency of Dr. Hyde. 34 delegates attended from France, Great Britain, Italy, Switzerland and USA, while Japan and Poland each sent an observer. It was announced that South Africa had been admitted to membership of the Commission but there is no record of this nor of the attendance of any delegation from that country at this Session.

Some changes of procedure were introduced at this Session. Interpreters from the International Labour Office were present to translate into English what was said in French and vice versa. Further, the President did not occupy the chair throughout; at his request delegates from different countries presided at the various technical meetings.

The number of papers and other communications was much larger than at previous Sessions, viz. twenty-nine, and these were grouped so that related subjects could be discussed at each of the five technical meetings. At the first of these meetings two of the papers presented, one by H E Ives and the other by P Fleury, dealt with the use of a full radiator (black body) as a primary standard of light. Further, on the proposition of the U.S. National Committee two resolutions were passed, one recommending the adoption of such a standard and the other asking the national laboratories to give effect to the proposal (a) by defining the construction and methods of use of the black-body standard and (b) by establishing a value for its brightness (now luminance) in terms of the "international candle".

At the second meeting the delegates discussed matters of nomenclature and a committee was set up to study the preparation of a lighting vocabulary. This committee consisted of a Swiss chairman and three other members, with such further additions in the future as might be necessary to secure the inclusion of one member for each of the languages officially represented in the CIE.

The third meeting was the most noteworthy in that it led directly to the standardization of what is now termed the relative luminous efficiency of radiation ($V(\lambda)$). The subject under discussion was heterochromatic photometry and a report of the committee on this subject, appointed in 1921, was presented by Prof. C Fabry.

Among the other papers read and discussed at this meeting was one by K S Gibson giving a résumé of the work so far published on what was then called the "relative visibility function" and including a table of values put forward by the author and E P T Tyndall as the result of a critical appraisal of the figures found by different observers using different methods. In view of the importance of having such a table internationally agreed for use in heterochromatic photometry, the Commission decided to recommend the provisional adoption of the set of values given in this paper. Thus the standard photometric observer was given a "provisional" existence which, although it has been threatened from time to time, still survives today. Another noteworthy step taken at this meeting was the appointment of a committee on colorimetry.

It was at the fourth technical meeting that the enlargement of the Commission's field of interest first became apparent, for the 7 papers then read and discussed dealt with various aspects of lighting practice; in particular there were 3 papers on public lighting.

At the fifth and last technical meeting, part of the time was devoted to a consideration of the report of the committee set up in 1921 to study the lighting of factories and schools. This report made a number of recommendations regarding the minimum values of illumination required for different kinds of work, the avoidance of glare and the provision of emergency lighting. After some amendments had been made, the use of the report as a basis for regulations regarding lighting in factories and schools was recommended. The remainder of the time at this meeting was mainly taken up by a discussion of the report of the committee on automobile headlights and of several other papers on this subject.

At the closing plenary meeting of this Session decisions reached at the various technical meetings were ratified and the officers were re-elected for a further period of three years, Dr. Hyde remaining President and C C Paterson combining as before the offices of Honorary Secretary and Treasurer. A decision sufficiently unusual to deserve mention was taken with regard to the financial contributions required from the various member countries. These were reduced from 50 to 35 shillings per million inhabitants, with a similar reduction in the maximum and minimum amounts.

The Proceedings of this Session, much longer than those of previous Sessions, were printed in England and for the first time, although the minutes and recommendations were in the French language, papers and reports were printed in the language (French or English) in which they were presented, each such report being preceded by a summary in all three of the official languages.

BELLAGIO 1927 AND SARANAC INN 1928

At the Geneva Session it was agreed that the Commission should meet in 1927 in the United States of America, though again the possibility that this might prove impracticable was not ignored and Italy was mentioned as a possible alternative. As time passed it became clear that the original plan could not be adhered to strictly and a compromise was ultimately arranged. The place of meeting remained unaltered but the holding of the Session was postponed for a year. In 1927, however, meetings of all the technical committees were held at Bellagio, Italy, and as these meetings were not restricted to the members of the committees the gathering was, in many respects, a full meeting of the Commission, although not a plenary Session with power to make official recommendations.

The total number of delegates at Bellagio was 67 and ten of the countries then in membership of the Commission, viz. Austria, Belgium, France, Germany, Great Britain, Italy, Japan, the Netherlands, Switzerland and USA, were represented. Prof. M Chatelain of USSR also attended.

The committees which had been appointed at different Sessions were six in number, dealing respectively with (i) Definitions and symbols, (ii) Vocabulary, (iii) Heterochromatic photometry, (iv) Lighting in factories and schools, (v) Automobile headlights and (vi) Colorimetry, and at Bellagio each of them except the last-named met at least once. There were also two "general meetings" of delegates and at the first of these an ad hoc committee was appointed to consider how best the work of the CIE might be developed in the future. Its report to the second general meeting recommended that the field of the Commission's activities should be divided into fifteen sections, including those six for which technical committees had already been appointed. The additional nine sections were as follows: (vii) Street lighting, (viii) Coloured glasses for signals, (ix) Diffusing materials, (x) Photometric test plates, (xi) Precision of photometric measurements, (xii) Light flux distribution, (xiii) Daylight, (xiv) Cinema lighting and, finally, (xv) Glare.

Each of the 15 sections was to be assigned to the National Committee of one of the member countries and that National Committee, called the Secretariat Committee for the corresponding subject, was to be responsible for fostering international study in its particular field and for maintaining contact with all other National Committees through experts appointed by those Committees. To quote the report:

"On s'attend à ce que le 'Secretariat Comité' fasse une étude spéciale de son propre sujet et soit responsable des rapports qui seront présentés à la prochaine réunion de la Commission ..."

The proposals just outlined were adopted by the Executive Committee and reported to the general meeting. As already mentioned, this meeting was not competent to take any official action on behalf of the CIE, so the new method of working was introduced by the Executive, acting under the authority of the statute by which it was entrusted with "complete responsibility for the affairs of the Commission". The matter has been referred to here at some length because the method by which the Commission carried out its technical work for over 40 years developed directly from the recommendation adopted at Bellagio in 1927.

Another decision taken by the Executive Committee and reported at the general meeting was the election of the Honorary Secretary, C C Paterson, as President until the next Session, to fill the vacancy caused by the resignation of Dr. Hyde. At the same time A Filliol (Switzerland) was appointed Treasurer.

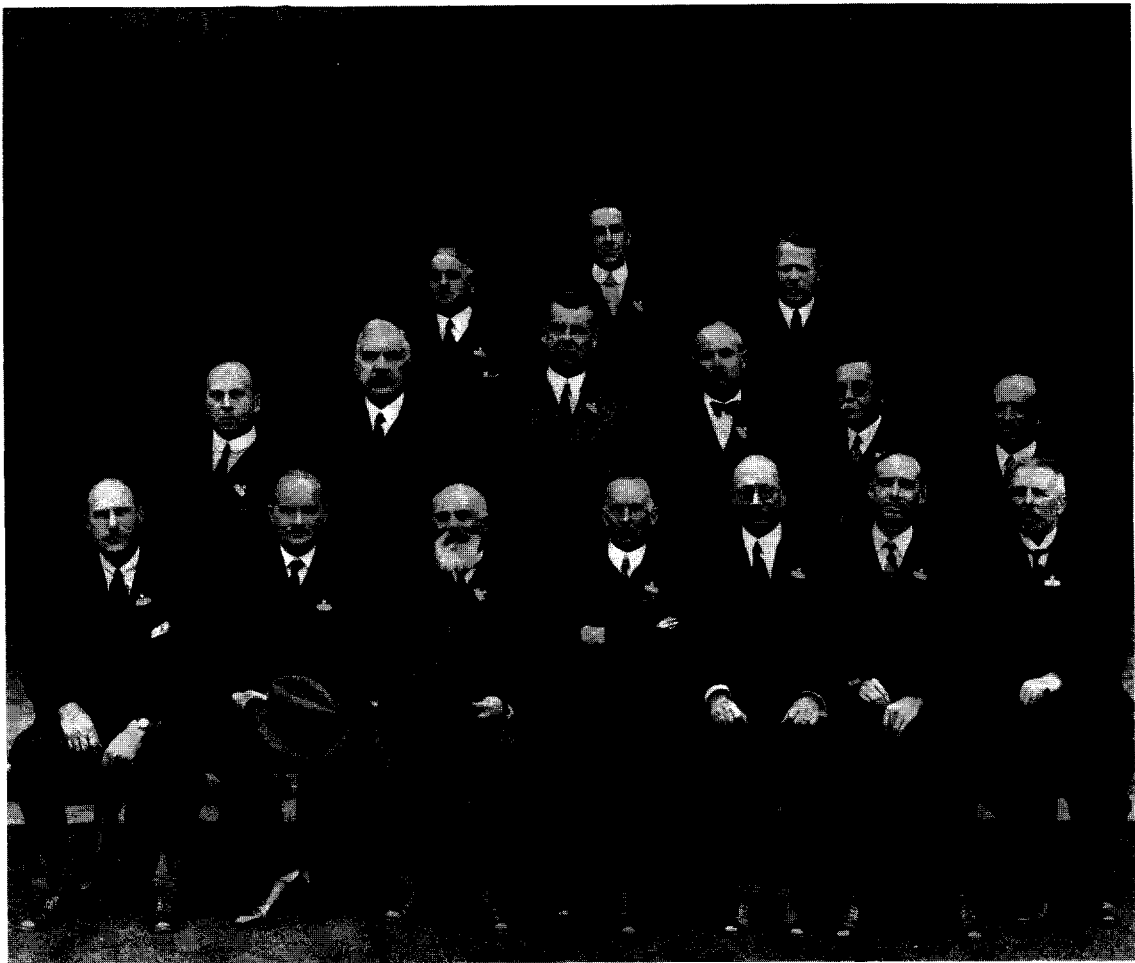
The seventh Session of the Commission was held in the United States of America in 1928, a year later than originally planned. The meetings took place at Saranac Inn, N.Y., from 24 to 28 September, but they were preceded by an "Illumination Congress". This began three weeks earlier with a series of technical visits in a number of cities in the USA and culminated in the Annual Convention of the American Illuminating Engineering Society at Toronto, Canada.

At Saranac Inn 67 delegates were present from nine of the member countries, viz. Austria, France, Germany, Great Britain, Japan, Netherlands, Sweden, Switzerland and USA. Neither Belgium nor Italy was represented on this occasion but there were observers from Brazil, South Africa and USSR.

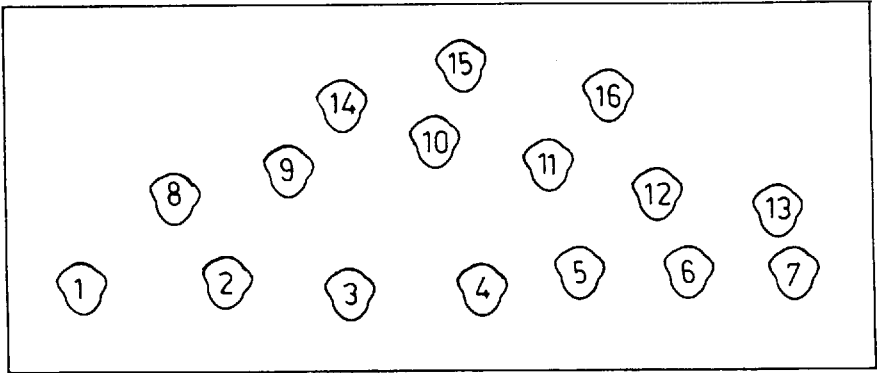


Visit to the Edison Laboratories, Crange, New Jersey, 6. Sept. 1928.

Thomas Edison is standing in the middle of the group.



Cambridge 1931. Leaders of the Delegations and Officers.



1. K Edgcumbe (GBR) - 2. W Dziobek (DEU) - 3. H Abraham (FRA) - 4. C C Paterson (GBR) -
5. A Filliol (CHE) - 6. E C Crittenden (USA) - 7. H de la Paille (BEL) - 8. A M Baidaff (ARG) -
9. A Enstroem (SWE) - 10. N A Halbertsma (NLD) - 11. L V Rihanek (CSK) - 12. R Hiecke (AUT) -
13. T Czaplicki (POL) - 14. C Clerici (ITA) - 15. J W T Walsh (GBR) - 16. I Folcker (SWE).

At the opening plenary meeting only formal business was transacted, but at subsequent technical meetings most of the secretariat committees presented reports on their respective subjects in accordance with the arrangements envisaged at Bellagio. In addition to these secretariat reports, 41 papers and other communications were presented and discussed in the appropriate meetings. For several subjects it was found necessary to hold more than one meeting in order to provide time for adequate discussion. Further, four additional meetings were held to discuss subjects other than those included in the list drawn up in 1927, viz. lighting education, aviation lighting, home lighting and shop-window lighting. As the Session was limited to five days, it was frequently necessary to hold two or even three meetings at the same time.

It is, perhaps, worth noting here that there were no professional interpreters at this Session; translations, where required, were provided by multi-lingual delegates present at the meetings. This arrangement was found to work satisfactorily and was adopted at all subsequent Sessions until 1955 when simultaneous translation was used for the first time.

The experience of the previous seven or eight years had shown that the Statutes, drawn up in 1913 when the CIE was first established, required some revision, and shortly before the opening of the 1928 Session the Executive Committee had appointed a committee of eight delegates, under the chairmanship of Prof. J Chappuis, to examine the matter. Their report was presented at the closing plenary meeting of the Session and a revised set of Statutes was adopted unanimously. The principal changes, which in fact did little more than regularise current practice, were as follows :

- (a) The number of delegates appointed by a National Committee was no longer limited to 10.
- (b) The appointment of study committees, with one of the National Committees as secretariat, was provided for in the Statute dealing with the organization of the Commission.
- (c) Every paper or communication was to be preceded by a summary in each of the three official languages.

Besides approving the new Statutes, the delegates at the final plenary meeting of the Session endorsed a number of recommendations made at technical meetings. Among these was the adoption of 85 cm as the height above floor level at which measurements of illumination in interiors should normally be made. The committee on colorimetry was urged to initiate a programme of research on matters fundamental to the establishment of a system of colour measurement. At the technical meeting on heterochromatic photometry it had been reported that the ratio between the "international candle" and the Hefnerkerze, accepted as 10/9 by the CIE in 1911, was in fact very noticeably different at different colour temperatures, ranging from 1.11 at about 2000 K to 1.17 at about 2600 K. The explanation was, no doubt, that in making the heterochromatic comparisons needed for deriving standards at the higher temperatures from those used at the time of the original agreement, different methods had been adopted in the different laboratories. The CIE therefore recommended that work should be carried out with the aim of finding a method of heterochromatic photometry which would give results in accordance with those obtained by spectrophotometry and the use of the values of $V(\lambda)$ recommended by the Commission in 1924. As a temporary expedient, values for the ratio of the two units at three different colour temperatures were recommended.

At the end of the Session the officers were all re-appointed for the period until the next Session except that, as C C Paterson was President, the office of Honorary Secretary was taken over until 1931 by Dr. J W T Walsh who had been General Secretary since 1920.

The extent to which the Commission's work had grown in volume and in scope may be gauged from the fact that the Proceedings of the seventh Session occupied no less than 1249 pages, nearly three times the number in the volume for the Geneva Session. The printing was done in America and again each paper and report appeared in the language of the original. The discussions at meetings, too, were reported in the languages used by the various speakers, but the official recommendations were given only in French, as required by the Statutes.

CAMBRIDGE 1931

The eighth Session, like that in 1928, was preceded by an Illumination Congress which this time took the form of a series of meetings at different centres in Great Britain, viz. Glasgow, Edinburgh, Sheffield and Birmingham. In each town there was a day of meetings, usually three in the morning and three in the afternoon, and at each meeting papers bearing on a single subject were presented and discussed. The total number of papers was 103 and these (but not the discussions) were subsequently published in two volumes of the same format as the CIE Proceedings. The arrangement by which a Session of the CIE was preceded by a series of meetings for the presentation and discussion of papers by individual authors was an attempt to satisfy the demands of those who put most emphasis on the first of the four "objects" of the CIE as set out in the revised statutes, viz. "To provide an international forum for all matters relating to the science and art of illumination".

Their views were not accepted universally and it was considered by some that if too much time were devoted to the reading of papers, the other objects, in particular the work leading to the promulgation of international recommendations, might be impeded. Ever since, however, the balance between these two points of view has been held satisfactorily, the emphasis shifting slightly to one side or the other according to the circumstances of the time.

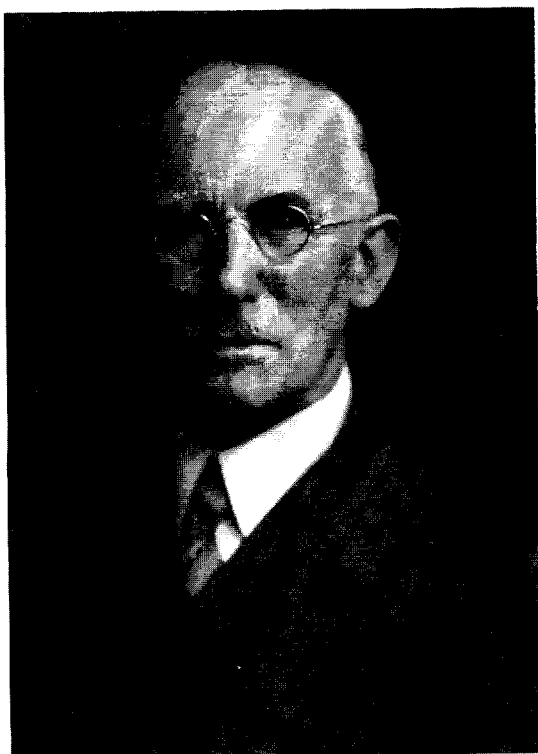
The Commission Session was held at Cambridge, in Trinity College, from 14 to 19 September and 152 delegates were present from 14 member countries, now including Argentina, Poland and Czechoslovakia. Hungary, too, was a member of the CIE but was not represented at Cambridge. Six other countries, viz. Canada, the Irish Free State, New Zealand, South Africa, Spain and USSR, sent observers.

The technical meetings were almost entirely devoted to the presentation of 19 reports from secretariat committees and to the discussion of matters arising from them. Practically all papers by individual authors had been dealt with at the Congress meetings and only six, those most closely connected with the Commission's work, were taken at Cambridge. One of these led to a decision that the CIE should undertake the study of the ultra-violet and infra-red radiation from light sources. Two of the others dealt with standards of luminous intensity and on this subject a small committee, with the CIE Bureau acting as secretariat, was set up to collaborate with the CIPM (Comité International des Poids et Mesures) which had recently decided to extend its work to include photometry.

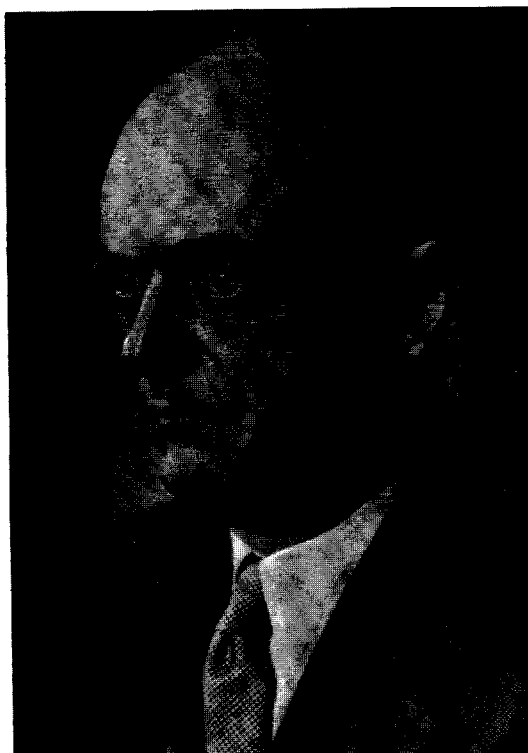
By far the most important matter dealt with during the course of the 1931 Session was the establishment of an international system of trichromatic colorimetry, the now generally accepted "CIE System". The primaries of the CIE chromaticity chart were specified and the colour vision characteristics of a "reference observer" were defined by extensive tables giving (a) the co-ordinates of points on the locus of spectral radiation in the chromaticity chart and (b) the distribution coefficients for light with an equal-energy spectrum (on a uniform wavelength scale) which was adopted as the "standard white" light. Three illuminants for use in colorimetry were defined, and a number of other recommendations regarding colorimetric measurement were made.

Aviation lighting was another subject in which a number of important recommendations were approved and a trilingual vocabulary of 39 terms was drawn up. On the subject of daylight it was recommended that any point in a room where the daylight factor was less than 0.2 per cent should be regarded as having insufficient daylight for ordinary work. The recommendations made in 1924 with regard to the lighting of factories and schools were endorsed, but the table of minimum values of illumination required for different kinds of work was supplemented by a new table giving the higher values that should be regarded as desirable. (A further short supplementary table of minimum values in schools was added at the 1935 Session.)

At the final plenary meeting the list of secretariat committees was revised and extended by the sub-division of several of the subjects in the list of 1928 and the addition of others. Dr. A R Meyer, head of the German delegation, was elected President until the conclusion of the next Session which, it was decided, should be held in Germany in 1934. C C Paterson resumed the office of Honorary Secretary and A Filliol was re-appointed Treasurer. W S Stiles, who had been General Secretary since 1928 continued in office until 1932.



*Sir Clifford C. Paterson, GBR
President: 1927-1931*



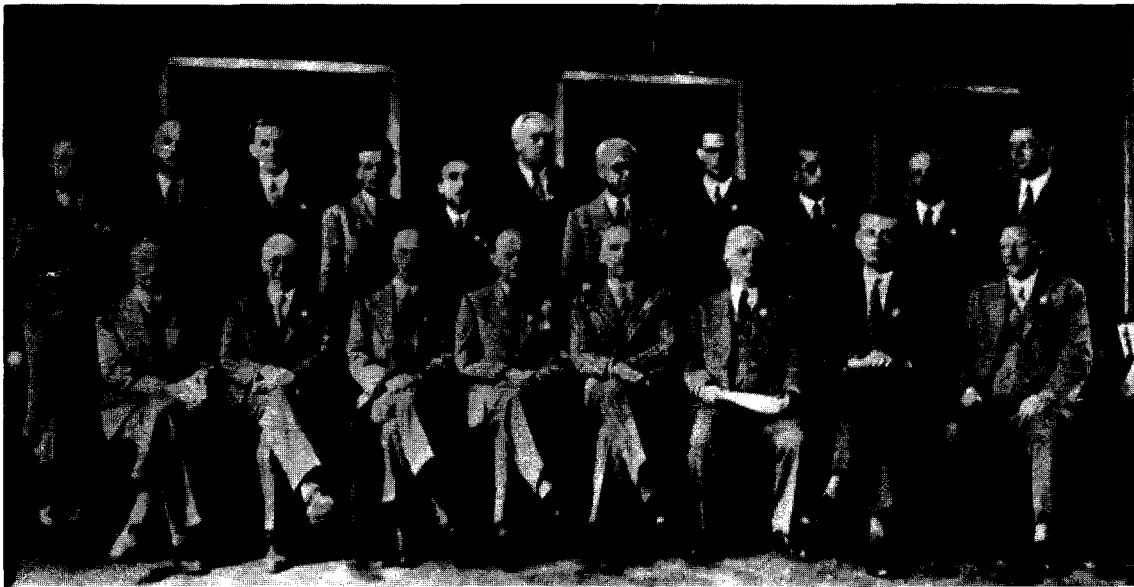
*Dr. A. R. Meyer, DEU
President: 1931-1935*



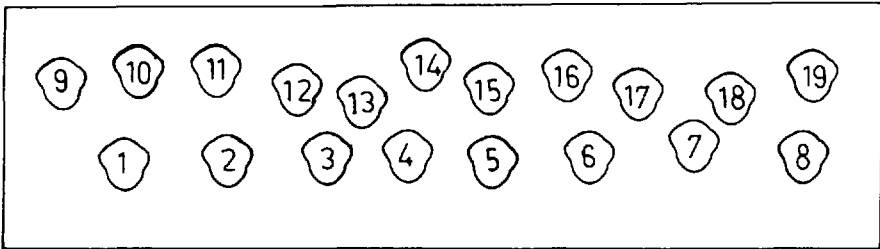
Berlin 1935. The Delegates in front of the Reichstag.



*Prof. C Fabry, FRA
President: 1935-1939*



Berlin 1935. Leaders of the Delegations and Officers.



1. T Lousberg (BEL) - 2. A Filliol (CHE) - 3. C C Paterson (GBR) - 4. A R Meyer (DEU) - 5. G Ribaud (FRA) - 6. C H Sharp (USA) - 7. N A Halbertsma (NLD) - 8. H E Henke (SWE) - 9. J Urbanek (HUN) - 10. L V Rihaneck (CSK) - 11. J W T Walsh (GBR) - 12. H Ruzicka (AUT) - 13. J A de Artigas (ESP) - 14. G H Stickney (USA) - 15. S Danesi (ITA) - 16. C Zwikker (NLD) - 17. Y Tada (JPN) - 18. T Czaplicki (POL) - 19. L Schneider (DEU).

BERLIN AND KARLSRUHE 1935

Three inter-sessional committee meetings were held after the 1931 Session. One, on units and standards, was held in Paris in October 1931; the other two took place at Zurich in September and October 1932 and were respectively concerned with the preparation of the vocabulary and with aviation lighting. The conclusions reached at the latter meeting, although without the status of official recommendations of the CIE, were nevertheless taken by the *Conférence Internationale Aérienne* as the basis for its recommendations to the *Conférence Internationale pour la Navigation Aérienne* (CINA), the body responsible for international agreements on matters concerned with air navigation (later to be rechristened ICAO, the International Civil Aviation Organization).

Owing to the severe economic depression of the early thirties, the ninth Session of the Commission was not held in 1934 as originally planned. It was postponed until the following year and the meetings were then held in two centres, viz. in Berlin from 2 to 5 July and in Karlsruhe from 8 to 10 July. In Berlin the meetings took place in the Reichstag building and in Karlsruhe at the Technische Hochschule. The number of delegates rose to 195 and the number of countries represented to 16, including Spain which had been admitted to membership since the previous Session. It was reported that applications for membership had recently been received from Rumania and USSR but no representatives of these countries were present.

The technical meetings were entirely devoted to the presentation and discussion of reports from all 25 secretariat committees and there were no papers by individual authors at this Session. For aviation lighting, which had become a subject of rapidly increasing importance, it was necessary to hold three long meetings. The results of the discussions at the inter-sessional meeting in Zurich were reviewed and again the recommendations made were lengthy and covered many aspects of the subject. They included specifications of the colours "aviation" red, yellow and green. It is worth noting that another committee, that on coloured glasses for signals, recommended somewhat different specifications for the red, yellow and green colours to be used in railway signals, while the committee on traffic signals included among its recommendations yet a third set of specifications for the colours of signals used to regulate road traffic. Another recommendation made at this Session was that lighting fittings should be classified in five groups according to the fraction of the total flux which was emitted either above or below the horizontal.

At a mid-sessional plenary meeting a revised list of subjects for study was approved. The number was reduced to 20 and appropriate terms of reference were drawn up for the guidance of the various secretariat committees. At the final meeting it was decided to invite Prof. C Fabry to accept the office of President. The Honorary Secretary and the Treasurer were re-appointed. J S Preston, who had succeeded W S Stiles in 1932, remained General Secretary and in fact he continued in that capacity until the first post-war Session in 1948. At the conclusion of the Session it was announced that the Dutch National Committee had invited the Commission to hold its next Session in the Netherlands.

1935-1939

A noteworthy event between the holding of the ninth and tenth Sessions was the publication in 1938 of the first edition of the International Lighting Vocabulary. The appointment of a special committee to study the preparation of such a document was mentioned in the account of the sixth Session at Geneva in 1924 and reports on the subject were made at Bellagio in 1927 and at Cambridge in 1931. At the conclusion of the Cambridge Session an "Editing Committee" was set up to prepare a draft of an international vocabulary in the three official languages of the Commission with a view to its ultimate publication as a document apart from the series of Proceedings of Sessions. This editing committee had a Swiss chairman, Prof. P Joye, and one member for each of the three official languages. It met in Zurich from 26 September to 1 October 1932 and prepared a first draft. This was submitted at the 1935 Session and it was then decided that, after the necessary editing, the Vocabulary should be

published by the Bureau of the Commission, with the terms and definitions in French, German and English and translations of the terms only in Italian and Spanish.

After a further meeting of the committee at Paris in June 1937, the document appeared at the end of 1938. It included 103 terms and their definitions in the three official languages and the Italian translation of the terms only. It was stated that the Spanish translation would be added later but in fact this never appeared. The format differed from that of the Proceedings, the page size (270 x 210 mm) being nearly the same as that of the present-day CIE publications. The terms, arranged logically and not alphabetically, were numbered consecutively and under each number the term, followed by its definition, appeared first in French and then in German and in English.

This arrangement was different from that adopted by the Commission Internationale Electrotechnique (later to be designated as IEC, the International Electrotechnical Commission), whose vocabulary included one section which covered lighting, and at the 1939 Session of the CIE the Editing Committee recommended that the lay-out of the second edition of the International Lighting Vocabulary should be similar to that of the electrotechnical vocabulary.

A number of the terms and definitions, including those of the principal photometric quantities and units, had already been agreed upon by the Commission, for at every Session from 1921 onwards sets of definitions, symbols, etc., had been put forward by the special committee on the subject and had been approved with the other technical recommendations mentioned in connection with the various Sessions.

The tenth CIE Session should have been held in 1938 but because of the economic situation it was thought wise to call a meeting of representatives of National Committees to discuss the matter. This meeting took place at Paris in June 1937 and it was then decided to defer the Session for a year and to hold it in the Netherlands in 1939.

SCHEVENINGEN 1939

The place chosen for the tenth Session was Scheveningen and the meetings were held there from 12 to 21 July. Again there was a small increase in the number of delegates; 217 attended from 14 countries. Denmark and USSR were now full members of the CIE and the former was represented at this Session but not the latter. On the other hand Argentina had resigned and Austria and Czechoslovakia had (temporarily) to be reckoned as part of Germany.

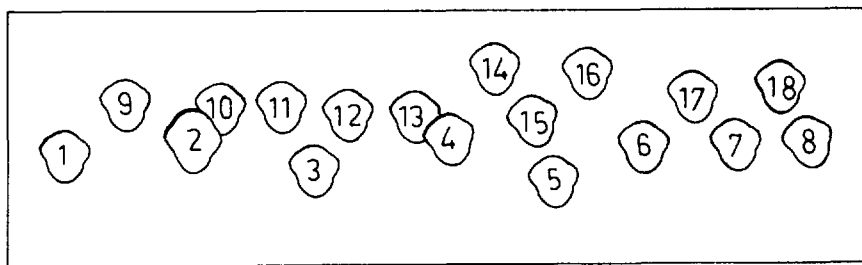
At the technical meetings 23 reports from secretariat committees were presented and discussed. In addition, 29 papers by individual authors were included in the programme. Generally a paper of this kind was presented during the course of the meeting held to discuss the secretariat report on that section of the Commission's work which embraced the subject of the paper. Two, however, were read during the course of a visit arranged for delegates as part of the technical programme of the Session, and one of these, by P J Bouma, dealt with the assessment of colour-rendering properties and formed the basis of a CIE recommendation in 1948.

Aviation lighting was again one of the most important matters dealt with and it is worth noting that a representative of CINA was present at the meetings and took part in the discussions on this subject. This was another mark of the close collaboration between CIE and CINA in matters such as signal lights and the lighting of airfields in which both bodies are interested. On the subject of automobile headlights, collaboration with another international body, the Fédération Internationale de Normalisation (later the ISO), was arranged and has continued ever since.

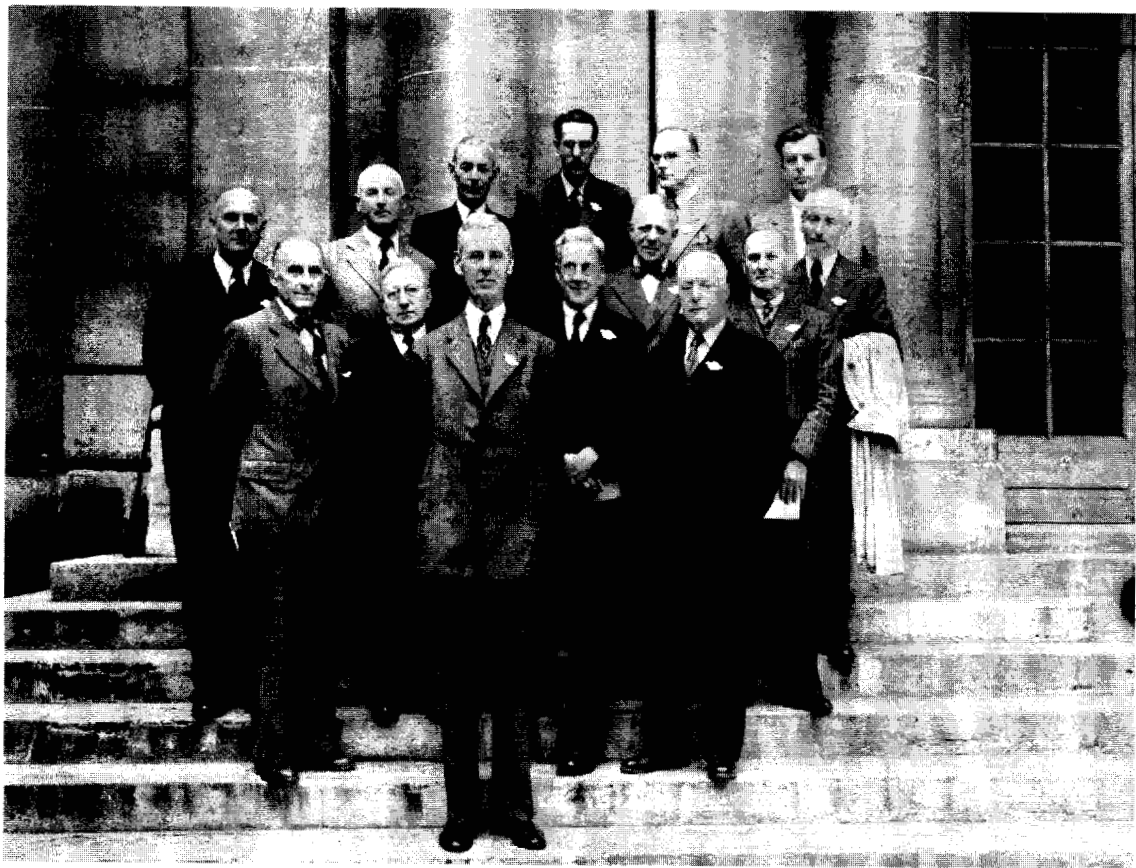
In furtherance of the search for a satisfactory method of heterochromatic photometry, initiated in 1928, it was decided that four colour filters should be exchanged between a number of national and other laboratories. Measurements of the transmission factors were to be made by different visual methods, including flicker photometry under carefully specified conditions, and by spectrophotometry. Unfortunately this programme could not be carried out, but after the war a somewhat similar series of measurements was organized by the Comité International des Poids et Mesures.



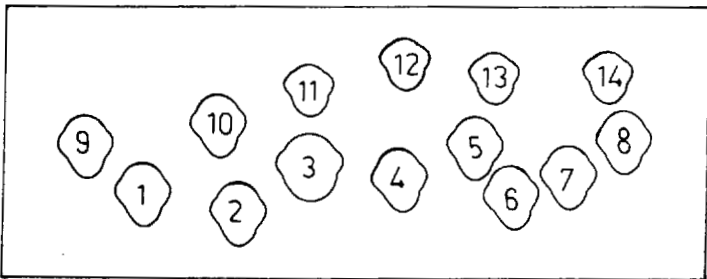
Scheveningen 1939. Leaders of the Delegations and Officers.



1. E Perucca (ITA) - 2. N A Halbertsma (NLD) - 3. C Fabry (FRA) - 4. L R Wentholt (NLD) - 5. P S Millar (USA) - 6. F Born (DEU) - 7. C C Paterson (GBR) - 8. T Lousberg (BEL) - 9. G Ribaud (FRA) - 10. A Filliol (CHE) - 11. I Hayashi (JPN) - 12. P Joye (CHE) - 13. B Zablocki (POL) - 14. G Nilsson (SWE) - 15. K Edgcumbe (GBR) - 16. B Pogany (HUN) - 17. P v. Braam v. Vloten (NLD) - 18. J S Preston (GBR).



Paris 1948. Leaders of the Delegations and Officers.



1. M Leblanc (FRA) - 2. P S Millar (USA) - 3. N A Halbertsma (NLD) - 4. J W T Walsh (GBR) - 5. I Folcker (SWE) - 6. W Trüb (CHE) - 7. S English (GBR) - 8. E Perucca (ITA) - 9. W W E von Hemert (NLD) - 10. L V Rihaneck (CSK) - 11. F Gruwez (BEL) - 12. H König (CHE) - 13. R Aspestrand (NOR) - 14. J G Weber (DNK).



Prof. Dr. N A Halbertsma, NLD
President: 1939-1951