

Minutes of the 18th Annual Meeting of the
Canadian National Committee of the CIE

(Held in the Physics Building, National Research Council,
Ottawa, 26 October 1973)

Members present: : Prof. M. G. Bassett
 : Mr. W. Budde (President)
 : Mr. J. M. Chorlton
 : Mr. G. F. Dean
 : Dr. P. K. Kaiser
 : Mr. A. Ketvirtis
 : Dr. J. D. Moreland
 : Mr. A. T. Orr
 : Dr. A. R. Robertson (Secretary)
 : Dr. C. L. Sanders (Vice-President)
 : Mr. C. W. Shearer
 : Dr. G. Wyszecski

Other delegates present : Mr. S. W. McKnight

Members absent : Mr. G. E. Davidson
 : Mr. F. R. Dorward
 : Mr. D. W. Frick
 : Dr. P. Manning
 : Mr. G. E. Mulvey
 : Mr. J. C. Wilson

1. Call to order and approval of agenda

 The President opened the meeting at 10:10 a.m. The tentative agenda was approved with the addition of an extra item: "Any other business".

2. Minutes of 17th annual meeting

 The Secretary read the minutes of the 17th annual meeting. A motion for their approval was made by Dr. Kaiser, seconded by Mr. Dean and carried unanimously.

3. Secretary's report

 The Secretary read his report, which is attached to these minutes. Mr. Chorlton moved approval of the report, Dr. Moreland seconded and the motion was carried unanimously.

4. Business arising from the minutes and the Secretary's report

The President said that he had approached several members to determine whether they would be willing to be nominated as chairman of their CIE Technical Committee. Dr. Kaiser was willing to be nominated as chairman of TC-1.4 (Photopic, Mesopic and Scotopic Vision) if a vacancy occurred, but felt strongly that the present Chairman, Dr. Kinney of the USA, was doing a good job and should not be replaced in the near future. Mr. Ketvirtis said that he could not get the financial support that would be necessary for him to become chairman of TC-4.6 (Street Lighting). The President was undecided whether to allow himself to be nominated as chairman of TC-2.3 (Photometric Characteristics of Materials). Mr. Chorlton urged the President to put his name forward, but the President said he was unsure whether he would have enough time to do the job. Dr. Wyszecski commented that many countries were unwilling to take responsibility for Technical Committees because of the cost involved.

Mr. Dean said that mine lighting was a very important subject, and that the CNC and the CIE should not ignore it. The President agreed, but said that in the past it had proved difficult for a Canadian delegate to obtain the necessary information from the provinces and territories which have jurisdiction for mining in Canada. Mine lighting is currently within the terms of reference of TC-4.1 (Interior Lighting) and therefore the Secretary said he would send copies of the correspondence to Mr. Dean, the Canadian member.

The President commented that CIE Bulletin No. 25 (April 1973) had contained Codes of Practice, Recommendations or Regulations from 5 countries. He asked members to send information on Canadian Codes of Practice, Recommendations or Regulations to the Secretary of the CNC, who would collect them together for publication in the CIE Bulletin.

Most members thought that Canadians from outside the CNC should be invited to join the delegation to the 18th Session of the CIE in 1975 if they could make a useful contribution. Preliminary steps to form a delegation will be made in April 1974 to enable members to arrange the necessary finances in good time.

The Secretary said that he expected a call for papers for the 1975 Session of the CIE in the near future. Dr. Wyszecski commented that papers would have to be relevant to the work of one of the Technical Committees.

The Secretary said that Mr. MacGowan had agreed to become the delegate to TC-4.2 (Daylighting) and was at present attending a meeting of that committee in Istanbul. He also said that Mr. McKnight and Mr. Dillon had obtained the permission of their superiors to become delegates to TC-4.4 (Sports Lighting) and TC-4.5 (Exterior Lighting) respectively. Mr. Snider had agreed to become the delegate to TC-4.7 (Automobile Lighting) and Dr. Manning had agreed to become the delegate to the newly-

reactivated Study Group B (Lighting and Architecture). This meant that for the first time in several years, the CNC now had a delegate to every Technical Committee and Study Group. The Committee welcomed this state of affairs.

5. Discussion of Terms of Reference of CNC/CIE

The Secretary read the proposed Terms of Reference of the CNC/CIE that he had prepared at the request of the National Research Council Committee on International Scientific and Technological Affiliations (CISTA). Professor Bassett moved approval of these, Mr. Shearer seconded and the motion was carried unanimously. The Secretary said that he would submit the proposal to CISTA.

Mr. Shearer then moved that "The CNC, recognizing an error in its ByLaws, approves the deletion of the words "as an Associate Committee of the Council" from By-Law No. 3". Dr. Moreland seconded and the motion was approved unanimously.

6. Discussion of reports from delegates to CIE Technical Committees and Study Groups

TC-1.1 (Definitions and Vocabulary): The Secretary presented Mr. Davidson's report. Dr. Sanders wondered if there would be duplication of effort if both the National Committees and the international Technical Committees suggested new terms to TC-1.1. Dr. Wyszecski did not think so. He said that it was the job of TC-1.1 to review and coordinate all suggestions.

TC-1.2 (Photometry and Radiometry): Dr. Sanders presented his report.

TC-1.3 (Colorimetry): Dr. Wyszecski presented his report.

TC-1.4 (Photopic, Mesopic and Scotopic Vision): Dr. Kaiser presented his report. Dr. Wyszecski suggested that other related Technical Committees should be given an opportunity to review the proposed "Report on Photometry (Problems and Recommended Procedures)" at an early stage.

TC-1.5 (Fundamentals of Lighting Calculations): Professor Bassett presented her report.

TC-1.6 (Fundamentals of Visual Signalling): Dr. Moreland presented his report. Dr. Wyszecski mentioned that he had received a draft of the document "Surface Colors for Visual Signalling" and had sent some comments to Dr. Walraven.

TC-2.1 (Sources of Visible Radiation): Mr. Dorward had reported that there had been no activity.

TC-2.2 (Sources of UV and IR Radiation): Mr. Budde presented his report.

TC-2.3 (Photometric Characteristics of Materials): Mr. Budde presented his report.

TC-2.4 (Luminaires): Professor Bassett presented her report.

TC-3.1 (Visual Performance): There was no written report, but Mr. Chorlton reported verbally on the work of the Committee, which had been very active.

TC-3.2 (Color Rendering): Dr. Robertson presented his report.

TC-3.3 (Fundamentals of Physical Environment): No report.

TC-3.4 (Discomfort Glare): Mr. Chorlton reported that there had been no activity.

TC-3.5 (Lighting and the Environment): The Secretary read Dr. Manning's report.

TC-4.1 (Interior Lighting): Mr. Dean presented his report.

TC-4.2 (Daylighting): The Secretary read Mr. MacGowan's report. Mr. Dean mentioned a building now being built in Toronto that will make extensive use of daylighting.

TC-4.3 (Lighting for Stage and Studio): Mr. Shearer presented his report. He also mentioned that a study recently completed on behalf of the Canadian Broadcasting Corporation showed no detectable deterioration of vision among TV studio lighting technicians.

TC-4.4 (Sports Lighting): Mr. McKnight presented his report. The President suggested that Mr. McKnight should form a CNC subcommittee for this subject which was very important to Canada because of the 1976 Olympic Games. Mr. Chorlton asked whether anything could be done to resolve conflicts between IES and CIE Recommendations. Mr. Shearer said that Canada had its own Codes for hockey and football, developed by the CBC. These were not always the same as IES Recommendations.

TC-4.5 (Exterior Lighting): No report.

TC-4.6 (Street Lighting): Mr. Ketvirtis presented his report and added that Mr. Hobson had resigned from this CNC subcommittee and that Mr. McKnight had joined the subcommittee.

TC-4.7 (Automobile Lighting): No report.

TC-4.8 (Airborne Lighting and Signals): No report.

SG-A (Psychological Problems in Lighting): Dr. Kaiser presented his report. Dr. Wyszeci said he expected that this Study Group would have completed its work by 1975 and would be disbanded.

SG-B (Lighting and Architecture): The Secretary read Dr. Manning's report.

SG-C (Cost-Benefit Relationships in Lighting): Mr. Orr reported that there had been no activity.

SG-D (Computers in Lighting): The Secretary presented Mr. Subotich's report. Mr. Orr regretted that the CSA found it necessary to use an American computer consultant.

The President said that he understood that a new study group on "Non-Sensory Effects of Radiation" would soon be announced. It was agreed that when Canada was asked to provide a delegate, the CNC would nominate Mr. D. Hoogveen of the Saskatchewan Power Corporation.

7. Appointment and Re-appointment of Members

The appointments of Mr. J. M. Chorlton and Mr. J. C. Wilson were due to end on 31 December, 1973. The Committee voted unanimously to recommend to NRC that these two members be re-appointed for four more years.

The Secretary moved that Mr. D. MacGowan, delegate to TC-4.2 (Daylighting), be recommended to NRC as a new member. Mr. Dean seconded and the motion was carried unanimously.

Professor Bassett moved that Mr. S. W. McKnight, delegate to TC-4.4 (Sports Lighting), be recommended to NRC as a new member. Mr. Orr seconded and the motion was carried unanimously.

8. Showing of film "Investigation of Automobile Headlighting"

This film, produced by the National Aeronautical Establishment of NRC, was shown to the Committee. After the showing, Dr. H.F.L. Pinkney, Mr. P. Huculak and Ms. A. M. Smiley of NAE/NRC answered questions about the film.

9. Discussion of the report of the subcommittee on "Lighting Research in Canada"

Copies of the subcommittee's report were distributed to the Committee, and Mr. Orr summarized its main points. The subcommittee

accepted that there was a need to co-ordinate and expand lighting research in Canada and suggested an organizational structure and method of funding and implementing such research. The President commented that the report omitted one important aspect -- that of the education of lighting engineers. He had prepared a draft of a questionnaire that he proposed to distribute to interested organizations and individuals in Canada to determine their opinions on the need for lighting research and on the most suitable type of organizational structure. Committee members felt that there was a need to identify the type of problem that required research effort, to identify potential sources of funds, and to decide whether the research should be co-ordinated within an existing organization such as a university. Dr. Kaiser agreed to modify the questionnaire along the lines suggested by the Committee and to send the new version to the President for distribution. Mr. Orr suggested that consulting engineers should be included in the distribution list.

10. Adjournment

There being no other business, the meeting was adjourned at 4:30 p.m.

A handwritten signature in cursive script that reads "A. R. Robertson".

A. R. Robertson,
Secretary.

Secretary's Report to the Canadian National Committee of the CIE

October 1973

1. The annual dues of \$1,100 (U.S.) for Canadian membership of the CIE for 1973 were paid by the National Research Council in January 1973.
2. Circular-letter no. 208CN was received from the Central Bureau in January 1973. This requested National Committees to send, to the Central Bureau, brief reports on Codes of Practice, Recommendations or Regulations. These reports will be published in the CIE Bulletin.
3. Circular-letter no. 212CN was received from the Central Bureau in February 1973. This asked each National Committee to list those Technical Committees for which it would be willing to take responsibility if a change in assignment were made.
4. In the spring of 1973, the President of the CNC was interviewed on the CBC radio program "As It Happens" as part of a series on lighting.
5. The CNC Executive Committee prepared two drafts of new CNC ByLaws. The first of these was circulated to all members on 11 December, 1972. The second, which incorporated members' suggestions, was circulated on 23 March, 1973 and approved in a letter-ballot. Fifteen members voted in favour, none voted against, and three abstained. The new ByLaws were effective on 31 May, 1973.
6. On 27 March, 1973 a memorandum was received from the NRC Committee on International Scientific and Technological Affiliations (CISTA). This suggested some changes to the ByLaws of the CNC and also suggested the adoption of terms of reference in line with the common format proposed for all Canadian National Committees for the International Council of Scientific Unions. The President and Secretary of the CNC discussed this memorandum with Mr. C. Gauvreau, Secretary of CISTA, on 28 March, 1973.
7. The memorandum from CISTA also reported that Messrs. Davidson, Dean, Ketvirtis and Mulvey had been re-appointed as members of the CNC for terms expiring on 31 December, 1976.
8. The third edition of the booklet describing the operation of the CNC was prepared by the Executive Committee and distributed in June, 1973. Distribution was to all members, delegates and subcommittee members

of the CNC, to about 150 libraries and to about 160 other persons in Canada. In addition 200 copies were sent to the Secretary of the Canadian Society for Color for distribution to members of that society.

9. A letter was received from the British National Committee in June, 1973 reporting progress in the arrangements for the 18th Session of the CIE which will be held in London from 10 to 18 September, 1975. The official agents for travel and accommodation are Thos. Cook and Son Ltd.
10. In July, 1973, both Canadian members of the CIE Executive Committee voted in favour of the admission of J. C. Monroy of the Philippines as an Associate of the CIE.
11. CIE Bulletin No. 25, published in April, 1973, contained a request to National Committees to determine whether it would be worthwhile to form a panel concerned with mine lighting. Several enquiries by the President of the CNC indicated that Canada would not be able to contribute usefully to such a panel.
12. In September, 1973, the President of the CNC submitted an invited article for publication in the CIE Bulletin. The article describes the activities of the National Research Council with special emphasis on activities within the scope of the CIE.
13. The Secretary of the CNC and the Deputy Secretary of the CIE exchanged several letters on the subject of damage to CIE Publications in transit from France to Canada, but these publications continued to be received in poor condition. The President of the CNC wrote to the President of the CIE on 18 May, 1973 on this subject and received apologies from the President and the Deputy Secretary. It is not known whether the packing methods have been improved since then because no more publications have been received.
14. NRC has continued to order new CIE Publications as they are announced and offer them for sale. A table attached to this report shows how many of each publication were bought by NRC and how many remain unsold.

A. R. Robertson

A. R. Robertson,
24 October, 1973.

CIE Publications - Status of NRC Stocks 19.10.73

	<u>Publication</u>	<u>Date of Order</u>	<u>Number Bought</u>	<u>Number unsold as of 19.10.73</u>
15.	Colorimetry	Sept,1969	200	78
15.1	Special Metamerism Index: Change of Illuminant	Oct,1972	200	178
17	International Lighting Vocabulary	Dec,1972	10	8
18	Principles of Light Measurements	Sept,1970	100	12
19	A Unified Framework of Methods for Evaluating Visual Performance Aspects of Lighting	June,1972	50	22
20	The Integrated Irradiance and the Spectral Distribution of Simulated Solar Radiation for Testing Purposes	Feb,1973	25	Not yet received
21A	Proceedings, Barcelona 1971 Vol. A	Dec,1972	10	1
21B	Proceedings, Barcelona 1971 Vol. B	Dec,1972	10	1
22	Luminance Distribution of Clear Skies	July,1973	10	Not yet received
23	Motorway Lighting	March,1973	50	Not yet received
24	Photometry of Indoor Type Luminaires with Tubular Fluorescent Lamps	June,1973	10	Not yet received
25	Procedures for the Measurement of Luminous Flux of Discharge Lamps and for Their Calibration as Working Standards	May,1973	15	Not yet received

The following summarized minutes show the activity of TC-1.2 in the past year.

Technical Committee TC-1.2 Photometry and Radiometry Meeting held in Varna, Bulgaria June 25-26, 1973.

It was announced that; a report prepared for TC-1.2 by W. Budde and C.L. Sanders on the "CIE Interlaboratory Comparison of Measurements of Photocell Spectral Sensitivity" will appear in Appl. Opt., Oct., 1973; a report prepared for TC-1.2 by C.L. Sanders and C.W. Jerome on "Interlaboratory Comparison of Measurements of the Spectral Irradiance from Fluorescent and Incandescent Lamps" will appear in Appl. Opt., Oct., 1973; "Procedures for Measurement of Luminous Flux of Discharge Lamps and for their Calibration as Working Standards", CIE 25 (TC-1.2) 1973 has been published by the CIE.

The following program was accepted.

1. O.C. Jones, N.P.L., U.K., will make a survey of the calibration facilities and research programs on Photometry and Radiometry of National Laboratories.
2. B. Steiner, U.S.A. will make a survey to determine the properties and availability of sources which are useful as secondary standards in the field of Photometry and Radiometry.
3. The scope of the proposed technical report on spectroradiometry will be reduced to consider only the measurement of spectral irradiance from mercury-fluorescent lamps. M. Nonaka's paper in Metrologia will be used as a basis of a questionnaire. The replies will be used in writing the report. Dr. O.C. Jones agreed to chair the subcommittee. C.L. Sanders will summarize the replies and Jones, Bauer and Schanda will prepare a draft report.
4. Under the chairmanship of W. Erb, Germany (FRG), the subcommittee on Reflection of White Diffusers agreed on a program which includes the preparation of a summary of presently available information on the properties of materials which are used as white standards or as integrating-sphere paints.
5. Dr. Bauer, Germany (FRG), will chair a Vocabulary subcommittee which will consider revision of the existing vocabulary and addition of new terms.
6. The work of the subcommittee on Spectral Irradiance Scales is proceeding with a comparison under the chairmanship of Dr. K. Yoshie, Japan. Preliminary results are expected later this year.
7. Mr. J. Moore, N.P.L., U.K. said that NPL would be willing to correlate a comparison of Spectral Radiance Scales. It was agreed to postpone initiation of such a project until the results of the spectral irradiance scale comparison are available.
8. The subcommittee on Receivers under W. Budde, Canada will concentrate on definitions and measurement of linearity and spectral sensitivity. It will investigate stable receivers.
Mr. W. Blevin, Australia will chair a subcommittee to commence revision in 1974 of "Principles of Light Measurements" CIE No. 18 (E-1.2) 1970.

Report on 1973 Activities
of CIE TC-1.3 (Colorimetry)

TC-1.3 met on July 9 and 10, 1973 at London, England.

Twelve members, 24 consultants, and 19 guests attended the two-day meeting.

Progress was discussed on the following items of the current working program of the Committee:

- i) Standard sources for colorimetry
- ii) Degree of metamerism
- iii) Color-difference formulae
- iv) Whiteness
- v) Chromatic adaptation
- vi) Terminology

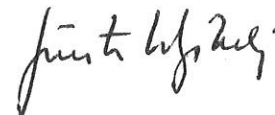
In addition to the above items, the committee discussed,

- a) a French proposal of a color space with logarithmic luminance scale (the proposal was rejected),
- b) the specification of the performance characteristics of colorimetric instruments (paper presented by Dr. Robertson of NRC),
- c) color temperature expressed in mireds.

The main topic of the meeting was the proposal of adopting a new color-difference formula of the cube-root type. It was suggested that such a formula would give very similar results to the Adams-Nickerson formula which has recently been accepted as a satisfactory color-difference formula in several industries. The cube-root version of this formula would be simpler but similarly effective.

Work on the exact form of the cube-root formula is under way.

October 22, 1973



Gunter Wyszecki,
Chairman, TC-1.3
(Colorimetry)

Annual Report 1972-73

CIE Committee TC 1.4 Photopic, Mesopic, Scotopic Vision

No meetings were held this year due to insufficient travel funds among the active members of this committee. All inter-actions were carried out via mail.

We are continuing to prepare the CIE Report on Photometry (Problems and Recommended Procedures). The deadline for the first draft was August 15, 1973. Dr. Jo Ann Kinney (Chairman) informed me that as of September 15, 1973 she received drafts only from Kaiser (Canada) and Palmer (U.K.). A copy of the schedule for writing is attached.

1. An outline of this report was submitted with last year's annual report.

September 28, 1973

Peter K. Kaiser
Canadian Member TC 1.4

PKK:ga

Enclosure

SCHEDULE FOR WRITING
CIE TC 1.4 REPORT

Date due

First draft of sections for which responsible - send to Kinney	Aug 15, 1973
First drafts compiled into preliminary, combined form - Combined form sent to Palmer, Roufs, Kaiser, Adrian for review	Oct 1, 1973
Comments on combined form back to Kinney	Jan 1, 1974
Drafts back to authors to with comments	Feb 1, 1974
Revisions made - Meeting of group	late spring 1974



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ANNUAL REPORT 1972-73

CIE COMMITTEE TC-2.4, LUMINAIRES

A meeting of the Committee was held in Ans-lez-Liege on January 29th and 30th, 1973. I was not able to attend the meeting but 11 members and 4 guests were present. There was a short discussion on measurements on ventilated luminaires dealing mostly with calorimetric measurements. The 3rd Committee draft of the "Report on Photometry of Luminaires for Streetlighting" was reviewed and the corrections sent to the members. A reply was sent in July to Mr. Fredericksen about Canadian practice in the specification of the reference half plane. Our practice varies from their recommendation and the German specification but if a drawing is included, the differences should not prove to be a problem. A draft for the photometry of floodlights has been prepared by Mr. Stephenson of Great Britain. The revised draft from this meeting is still to be distributed.

A meeting was held in Copenhagen last Thursday and Friday (October 18th and 19th) which I was not able to attend. The minutes of that meeting are not available yet.

CIE COMMITTEE TC-1.5, FUNDAMENTALS OF LIGHTING CALCULATIONS

A draft of a CIE Code on lighting calculations of rooms was received in June. No changes were suggested in the proposals. I have not received any notice of meetings held this year.

Marion G. Bassett,
Canadian Member C.I.E.

October 25, 1973



Committee TC-1.6
"Fundamentals of Visual Signalling"

Minutes of the meeting in London, England of the committee in January, 1973 were received in August. The progress reported is summarised below.

1) Revision of Publication No. 2 (Revised)

The draft of this publication has been approved by 12 National Committees (Canada, Denmark, F.D.R., France, India, Japan, Netherlands, Poland, Portugal, Rumania, Sweden and U.S.A.). The final draft included changes that were either editorial or corrections of errors. There were no technical changes.

2) Recommendations for Surface Colors

This is now considered to be the most urgent task of TC-1.6 since three international organisations are awaiting the committee's recommendations.

Dr. Walraven reported progress on a document "Surface Colors for Visual Signalling". Separate subcommittees are working on draft reports on (1) conventional surface colors, (2) retroreflective colors, (3) fluorescent colors, and (4) measurement techniques. These reports will be combined finally into an official CIE recommendation.

3) Road Traffic Signals and Signs

TC-4.6 had put road signs on its program but decided that "legibility of signs as determined by size, contrast and color of the letters, arrows etc. should be dealt with by TC-1.6. Prof. de Boer had requested TC-1.6 to establish a CIE viewpoint on the fundamental characteristics of luminous signals for road traffic. The appointment of an ad hoc committee of "consultants" is being considered.

4) Illuminance and Contrast Thresholds.

The thresholds defined by various international organisations and by individual states were discussed.

5) Application of Flashing Lights

Methods of calculating the effective intensity of flashing lights were discussed. The utility of flash coding and flash frequency were discussed.

6) Terminology

Copies of a paper "Terminology for Flashing Light Signals" by J.G. Holmes (presented at CIE, Barcelona, 1971) were distributed. The wider distribution of his paper through the "IALA Bulletin" and "Applied Optics" was suggested.

7) Handbook on Visual Signalling

No significant progress to report.

8) Other Organizations

The International Electrotechnical Commission had submitted a proposal for a flashing blue light signal for identification lights on medical mission aircraft.

9) Next Meeting

Planned for spring 1974 in Washington.

Report on the Activities of CIE TC-2.2
Sources of UV and IR Radiation

The committee held one meeting in October 1972 at Hamburg, Germany. I was unable to attend. According to the minutes, the following items were discussed.

1. The "Recommendations for the Integrated Irradiance and the Spectral Distribution of Simulated Solar Radiation for Testing Purposes" had been submitted for printing and is now available as CIE Publication No. 20.
2. The new Working Program, as described at the Barcelona Session was explained.
3. The cooperation between TC-2.2 and the Commission Internationale de Photobiologie was established.
4. A report on new UV and IR sources is being prepared.
5. A recommendation for standards of UV radiation is under consideration.

W. Budde

October 22, 1973

W. Budde,
Canadian Member for TC-2.2

Report on the Activities of CIE TC-2.3
Photometric Characteristics of Materials

The chapter on Measurements of the Characteristics in the Technical Report was rewritten by F. Billmeyer, W. Budde and F. Grun and a draft for the English version was prepared. Some parts of this were amended by the Chairman of TC-2.3, Professor Krochmann.

TC-2.3 held one meeting in July at London, England. I was unable to attend. According to the Minutes the following points were discussed.

1. Coordination with other Technical Committees or Working Groups: various Technical Committees and Subcommittees reported on their activities related to the work of TC-2.3.
2. The Technical Report on "Radiometric and Photometric Characteristics of Materials and their Measurement" was discussed and revised.
3. The five subcommittees on gloss, fluorescent materials, ageing effects, turbid media and polarization gave reports on their activities.
4. Future of TC-2.3: Germany will relinquish this Committee at the next General Session. The members proposed and agreed that this Committee should be assigned to Hungary with Dr. Schanda as Chairman.

The US TC-2.3 held a meeting at Rochester in October, which I attended. The various activities of TC-2.3 were discussed.

W. Budde

W. Budde,
Canadian Member for TC-2.3.

October 22, 1973



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ANNUAL REPORT 1972-73

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Marion G. Bassett,
Canadian Member C.I.E.

October 25, 1973



CIE TC-3.2 (Color Rendering) - Report to CNC/CIE for 1972-73

There has been one meeting of TC-3.2 during the last year. It was held in London, England in July following the AIC "Colour 73" meeting. I was able to attend.

Work has been completed on the second edition of CIE Publication 13 and it was due to be ready for printing in August or September this year.

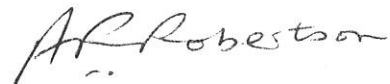
The committee discussed tentative proposals for a colour preference (or colour flattery) index. If adopted, such an index will be calculated in the same way as the CRI, but the actual colours of test objects will be compared to the preferred colours of similar objects. With regard to further improvements to the CRI, work continues on the subjects of chromatic adaptation and fluorescent test colours.

The next meeting will probably be held in Hungary in September 1974.

The TC-3.2 subcommittee on light sources for colour reproduction held its first meeting, also in July, but I was unable to attend because of a clash with the TC-2.3 meeting. I understand that the meeting was mainly of a constitutional nature and that the working program will be initiated by correspondence.

Mr. Münch will retire from the chairmanship of TC-3.2 in 1975. The Netherlands and the U.K. are both interested in taking over the secretariat from West Germany.

I have become a member of the IES Color Committee. This Committee also acts as US-TC-3.2 so this should lead to good cooperation and coordination between Canada and the U.S. in colour-rendering matters.



A. R. Robertson,
Canadian member of TC-3.2

October 22, 1973

CANADIAN NATIONAL COMMITTEE OF CIE, 1972/73

CNC/CIE, CIE Committee TC 3.5, 'Lighting in the environment'
Annual Report by Canadian Member

The Committee has been quite active this year.

The terms of reference were established during the initial meeting in Paris in September 1972 as:

- i) To develop appraisal procedures for relating subjective judgments to the lighted environment.
- ii) To produce suitable design guides for the lighted environment.
- iii) Terminology.

The Committee's emphasis is clearly on appraisal (or evaluation) of lighting installations. These different kinds of appraisal were established:

Appraisal A. For the general interest and self education of those not expert in lighting.

Appraisal B. To assist in encouraging communication between architect and lighting designer.

Appraisal C. To produce results that can be analysed, to provide indications for better design.

The general approach of the appraisals will be concerned with subjective aspects but provision must be made for objective data for the environment being appraised, should the appraiser wish to include this.

Further meetings have been held: in Eindhoven, in May 1973, and in Helsinki, September 1973.

A substantial part of the Eindhoven meeting (at least, of the one day I was able to attend) was given over to a presentation of lighting design objectives and design methods in France. This was to be developed further in Helsinki (I was unable to attend that meeting). Other matters to be considered in Helsinki included questions on education of lighting engineers, communication between architects and lighting engineers, arrangements for the 1975 Congress, and a presentation by Dr. H.L. Logan of the USA.

Peter Manning

Director, School of Architecture
Nova Scotia Technical College
P.O. Box 1000
Halifax, Nova Scotia, Canada

October 12, 1973

copies to: H. Hewitt
W.K. Lumsden

1973 ANNUAL MEETING
CANADIAN NATIONAL COMMITTEE of CIE
REPORT of TC 4.1 - INTERIOR LIGHTING

There have been two meetings of the committee in the past year. The first meeting was held in Copenhagen on the 26th and 27th of March, 1973. There were nine members present including Mr. W. R. Stevens, CIE President.

The meeting was held for further work on the Interior Lighting Guide. From the minutes, it was apparent that there was considerable discussion on Section 1 Illuminance. Suggestions were made for changes in the version submitted by Dr. Fischer.

Sections 2 through 9 were accepted with minor additions.

Section 10 - Calculations of Values of Luminance and Illuminance received much attention mainly because most countries favor their own systems. It was agreed that the submitted material should go to TC1.5 Fundamentals of Lighting Calculations for approval.

A questionnaire had been sent to committee members asking if the committee should consider mine lighting. The response was minimal but several replies indicated approval including Canada & U.S.A.

The next meeting was in Brussels after the three day meeting of the Second European Light Congress. Philips were hosts and provided all desirable facilities - a well-lighted conference room, three beverage breaks and a full course luncheon. Chairman Dykes Brown was pleased that it was the best attended meeting yet. There were about 18 present, most from Europe, one from South Africa, one from U.S.A. and one from Canada.

The minutes have not been received but considerable discussion took place on Discomfort Glare, Integration of Lighting & Air Conditioning, Calculation of Luminance and Illuminance and a document by R.T. Dorsey on Energy Optimization.

The discussion on Discomfort Glare was because Mr. Lowson, Chairman of TC 3.4 replacing Dr. Guth of U.S.A. was critical of the "glare limiting method" developed by TC 4.1 since it differs from the VCP method proposed as a CIE method. A vote of TC 4.1 members present retained the committee method but agreed to call it an interim system and to enlarge on VCP in the text with other systems.

Editorial changes were considered in Lighting & Air Conditioning.

An entirely new treatment on Calculation of Illuminance was distributed and discussed.

Section 8 - Maintenance and Depreciation was enlarged to include more of our I.E.S. material.

Chairman Dykes Brown expressed pleasure with the success of the meeting, progress of the Guide and optimism that the Guide would be in completed form in time for the 1975 quadrennial Congress.

The Chairman of CNC TC 4.1 was given two assignments.

October 22, 1973



G. F. Dean
Chairman, CNC TC 4.1

ANNUAL REPORT TO CNC, CIE COMMITTEE

From Subcommittee T.C.-4.2, Daylighting

- 1) Established subcommittee - names of members communicated to and accepted by CNC.
- 2) Meetings of local T.C.-4.2 members arranged at regular intervals:
 - (i) to ascertain objectives in terms of CIE/CNC brief
 - (ii) to determine the role of daylighting in the Canadian built environment scene
 - (iii) to review methods and relevance of daylighting design tools in terms of (ii)
 - (iv) to review methods and relevance of daylighting design tools in terms of current and predictable future architectural practice
 - (v) to review methods and relevance of daylighting design tools in relation to thermal and acoustical design criteria.
- 3) Review of (2) is in progress.
- 4) A paper - "Creative Application of Digital Computers Daylighting II" is to be presented at the T.C.-4.2 symposium in Istanbul by David McGowan. The paper will be presented as a Canadian Contribution at the closed session T.C. -4.2 meetings. A copy of the paper has been sent to CIE/CNC on the 18th of October, 1973.

15 October, 1973.

R. Lakowski
Secretary CNC/CIE Subcommittee
T.C.-4.2 Daylighting

Report to Canadian National Committee,
October 1973.

International Commission on Illumination (C.I.E.) Reference T.C. - 4.3
Lighting for Stage and Studio.

The committee on Lighting for Stage and Studio has not been very active since the Barcelona 1971 meeting. The secretariat of the committee is assigned to Great Britain with Mr. K. R. Ackerman B.B.C. chairman. The main reason for the inactivity appears to be due to a lack of contributions from members but the Secretariat is hoping to generate some activity.

Canadian activities in this field have been minimal during the past year. C.B.C. has placed the Maison de Radio Canada, Montreal in operation and has the Regional Broadcasting Centre under construction in Vancouver. A few theatres have revised or are revising existing installations.

C. William Shearer

Annual Meeting Report on the Activities of CIE TC-4.4 "Sportslighting"

Presented at the National Research Council of Canada, Ottawa,
October 26, 1973.

Considerable correspondence has been received from the Chairman and members of the CIE TC-4.4 Sports Lighting Committee.

A report was received in the form of a letter Dated November 27th Zurich from Mr. H. Kessler detailing the information of the first meeting held on the 20th and 21st of November 1972 in Munich.

Several working groups were formed to study special projects. Work Group #2 were asked to gather and study guiding principles, recommendations and standards etc., valid for the present day for the following:-

- Football grounds (Soccer)
- Swimming Pools
- Tennis Courts (indoor and outdoor)
- Ice skating rinks (indoor and outdoor)
- Sports Halls (gymnastic halls, halls for multiple purposes)

The members of Work Group (WG) #2 are as follows:

J. Balder/ Netherlands
R.E. Faucett/ USA
B. Habro/ Sweden

H. Kessler (Chairman)/Switzerland
H. Prochazka/ Austria

Mr. Kessler requested that we mail all our recommendations, valid in Canada, to him by January 1973 and this was done. The recommendations that I mailed consisted of the IES "Current Recommended Practice for Sports and Recreational Area Lighting", RP-6. The practice has been adapted as CSA Standard C92.5 -1971 and I so stated this to Mr. Kessler in my letter to him on January 18th. Mr. Kessler acknowledged receipt of the materials I sent him by his letter to me dated March 22nd, 1972.

On May 28th I received a Progress Report on TC4.4 Working Group 2 after their meeting on 10th May 1973 in Zurich as follows:-

Progress report of TC-4.4 Working Group 2

1. On 10th May, 1973 a meeting was held in Zurich in order to lay down the working schedule of Group 2.

Participants:

A. Wald (Chairman)
C.-H. Ziesenib (Secretary)
H. Kessler (Chairman of Working Group 2)

2. Members of Working Group 2:

H. Kessler (Chairman)	- Sports halls	
Mr. Balder	- Football	
Mr. Faucett	- Swimming	indoor and outdoor
Mr. Hobro	- Tennis	
Mr. Prochazka	- Ice-Sports	
Mr. Vallat	- Swimming	

3. State of affairs of Working Group 2

In his letter of 27th November 1972, Mr. Kessler requested participants of the TC-4.4 to send in those recommendations of sports lighting which had been finished already or were still being prepared.

The results were as follows:

Australia: no special recommendations

Belgium: no special recommendations; only for sports lighting in schools

Bulgaria: no special recommendations

Canada: are using IES code of the US

Denmark: Danish Standard (DS 700)

Some values on sports lighting have been included in the recommendations for indoor lighting. Special standards for sports lighting in preparation.

Finland: recommendations for football, swimming (indoor), tennis and ice-skating rinks

France: the future national recommendations for sports halls, indoor swimming, football, tennis (indoor + outdoor), and ice-sports are based on a Report of the AFE (Toulouse 1972)

Germany: special recommendations
DIN 67 526 sheet 1 "Sports lighting - Requirements for artificial lighting",
DIN 67 526 sheet 2 "Sports lighting - lighting for television"

Iceland: no special recommendations; are using the Swedish recommendations

Italy: recommendations of the "Associazione Italiana di Illuminazione" for sports lighting

Japan:	recommendations in the "Lighting Data Book" edited 1968 by Illuminating Engineering Institute of Japan
Yugoslavia:	no special recommendations
Netherlands:	recommendations for football and sports halls
Poland:	no special recommendations. General values by Polish Standards Committee
Sweden:	only recommendations for football
Switzerland:	recommendations for swimming (indoor + outdoor) 1967; tennis (indoor + outdoor) 1962, ski-jumps (1964); skittle or bowling alleys (1966); ski courses and lifts (1966); sports halls and athletics (1973); ice skating (1971); playgrounds and gymnasiums (1971)
USA:	IES recommendations for sports lighting Committee ; tennis and swimming is being revised

There has been no reply to Mr. Kessler's request from the following countries: Chile, Great Britain, Israel, Norway, Austria, Portugal, Spain, Czechoslovakia, Hungary, UDSSR.

4. Preparation of a Guide for sports lighting

In order to obtain a uniform arrangement of the various subjects "Sports halls", "Football", "Swimming", "Tennis", "Ice sports", the following list of contents has been set up:

1. Introduction
2. Factors of good illumination
 - 2.1. Visual tasks
 - 2.1.1. Visual tasks for players
 - 2.1.2. Visual tasks for spectators
 - 2.2. Illumination levels
 - 2.3. Illumination uniformity
 - 2.4. Diffusion
 - 2.5. Disability glare
 - 2.6. Colour Appearance, Colour Rendering
3. Lamps, Luminaires and lighting design methods
4. Maintenance
5. Measurement of Illuminance
6. Daylight in sports halls.

5. Mr. Kessler will send the list of contents with a short explanation and the relevant recommendations of the various countries to the members of Working Group 2 in June 1973.

The drafts prepared by the members should be returned to Mr. Kessler by 1st October 1973. At the next TC meeting on 6th and 7th November, 1973 (in Eindhoven), the drafts will be presented by the members,

and will be discussed afterwards.'

(Signed) Ziesenib

Note- Please notice that I received the "Third draft for "The Lighting of sports events for Color TV Broadcasting" on October 2nd. I did not have an occasion to read this draft until the 9th of October so they have not been returned or commented upon as requested. Possibly you would like to comment on what action I should take in this regard.

Remarks

It is an excellent 18-page report.

Attached to this "third draft" I received Preliminary notes on "Investigation of the Vertical, Cylindrical illuminance as quality requirements in connection with sports lighting for TV and Film Broadcasting". This is an investigation by a work group under the Danish Sports Lighting Committee.

Remarks

This is an excellent study but as it too is quite lengthy, 14 pages, I did not make 25 copies but could provide them to any interested party if requested, provided that this is customary.

An invitation from the Secretary C.H. Ziesenib was received on September 20th to attend the CIE TC-4.4 second meeting on Sports Lighting on November 6th and 7th in Eindhoven. The agenda is as follows:-

1. Discussion concerning the third draft of the technical report "The lighting of sports events of colour TV broadcasting" (the draft will be distributed in time before the second meeting).
2. Decision on the final version of the technical report "The lighting of sports events of colour TV broadcasting".
3. Presentation and discussion concerning the first draft of working group 2, which prepared a guide for the lighting of major grounds areas including football, swimming, ice-sports, tennis and of sports halls.
4. State of affairs as far as the tasks of working group 3 "Fundamentals of sports lighting" are concerned.
5. Report by Mr. Vallat about "Terminology".

6. Visit to some sports facilities near Eindhoven to have a look at interesting sports lighting installations (at the evening of 6th November).
7. Various items.

As you will note on Page 3 in the Progress Report on the 10th of May 1973 that the USA IES Sports Committee are preparing a set of revised recommendations on tennis and swimming. I want to advise that as I am a member of that Committee I have the last "draft" on the new tennis lighting recommendations which Mr. R.E. Faucett no doubt has sent to Mr. Kessler.

Copies of this report could also be available and as direct and indirect, lighting systems are mentioned for pole or messenger cable mounting. This report should be reviewed as it may soon become the new practice for IES in Canada and USA.

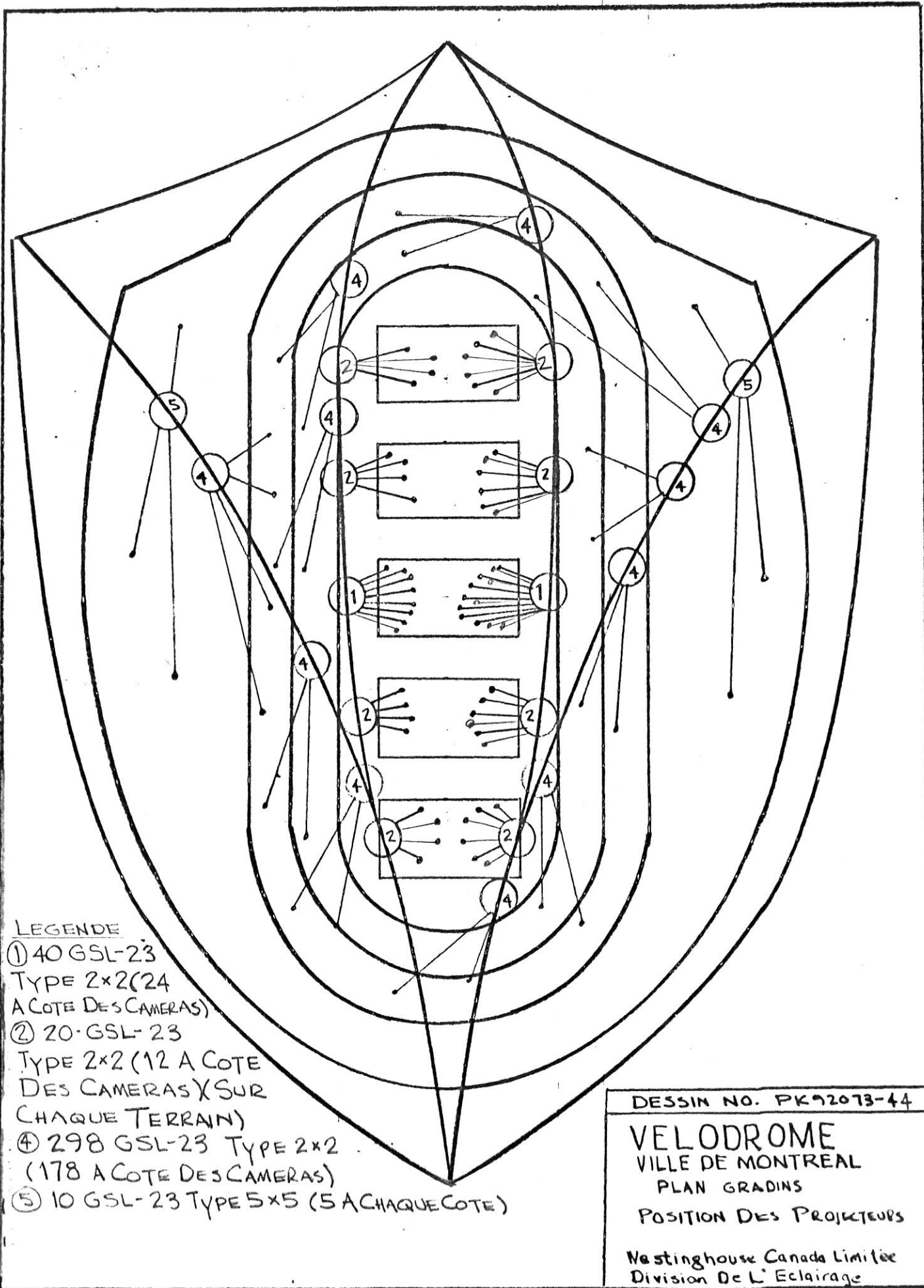
As a matter of interest I ask your indulgence on the following points of interest:-

1. Time does not permit me to attend the Sports Lighting meeting November 6th and 7th in Eindhoven.
2. A discussion was held with Mr. Thomas M. Lemons in Boston on April 6th who was the CIE TC-4.4 member for USA with Mr. R.E. Faucett. We discussed IES and CIE matters and Mr. Lemons indicated that the Canadian recommendations for sports lighting were far too low for the Olympic competitions slated for Montreal in 1975 and 1976.
3. In line with the above you should be aware of the present state that exists with relation to the Velodrome which is under construction in Montreal. (Please see the attached sketch) and it is to be ready for the early 1975 competition. Consulting Engineers have been appointed. It is of interest to note that 150 maintained footcandles (1614 lux) on a vertical plane is being considered which is the apparent CIE recommendations for several European Countries (See Page 13 Table 3 of the "third draft" mentioned previously).
4. The olympic stadium design is firming up and lighting recommendations are being worked on at this time.

This first lengthy report is respectfully submitted and I would like the Canadian National Committee to make recommendations and suggestions on what active part should be taken concerning our possible position on lighting matters related to the Olympic Games.

S.W. McKnight, P.Eng.
FIES
TC-4.4 Sports Lighting Canada.

10 22 73.



LEGENDE

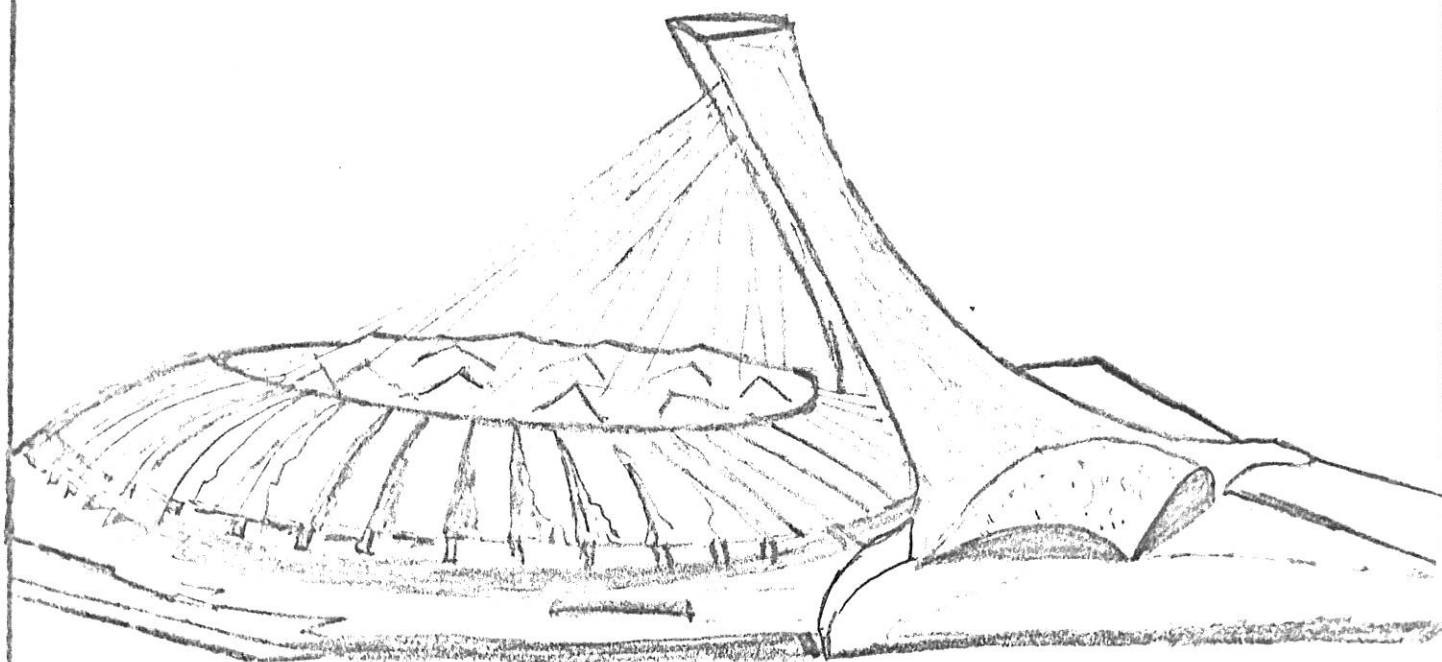
- ① 40 GSL-23
TYPE 2x2 (24
A COTE DES CAMERAS)
- ② 20 GSL-23
TYPE 2x2 (12 A COTE
DES CAMERAS) (SUR
CHAQUE TERRAIN)
- ④ 298 GSL-23 TYPE 2x2
(178 A COTE DES CAMERAS)
- ⑤ 10 GSL-23 TYPE 5x5 (5 A CHAQUE COTE)

DESSIN NO. PK92073-44

VELODROME
VILLE DE MONTREAL
PLAN GRADINS

POSITION DES PROJECTEURS

Nestinghouse Canada Limitée
Division De L' Eclairage



OLYMPIC STADIUM
— MONTREAL —

C.I.E. COMMITTEE TC-4.6

PUBLIC LIGHTING

ANNUAL REPORT 1973

Committee TC-4.6 held two major meetings during 1973, and the working groups had numerous discussions on various assignments to investigate special aspects of roadway illumination and visibility. These investigations are being carried out in connection with revisions to Document #12 covering Roadway Lighting Practice.

To illustrate the present nature of work being done by this committee the Agenda of the meeting held in Budapest is attached. The writer had the pleasure of attending this meeting, which preceded the IRF World Highway Meeting in Munich. During the IRF Conference in Munich a discussion between CIE TC-4.6 and PIARC was held to resolve some differences of opinion regarding CIE Tunnel Lighting Recommendations. The writer also attended this discussion.


A. Ketvirtis

Chairman TC-4.6 of CNC

DRAFT

A G E N D A

FOR THE MEETING OF TC-4.6.

IN BUDAPEST

11 - 12 OCTOBER 1973

1. Preliminaries
 - 1.1. Various communications
 - 1.2. Approval of the draft agenda
2. Confirmation of the Minutes of the Meeting in London
(21 + 22 March 1973)
3. Correspondence
4. Road Surface Luminance
Progress report from Working Group 8. (Attached)
5. Revision of C.I.E. Publication Nr. 12
 - 5.1. Reports from Working Groups
 - 5.2. Report on the influence of G on the economy
of installations
 - 5.3. Revision of definition of flashed area.
6. Contents of Technical Reports
See Note to Annex II, Minutes London
7. Lighting of Road Traffic Signs
Report from Working Group 9
8. Problems related to Tunnel Lighting
Information on progress by PIARC/C.I.E. Working Group
9. Revision of Streetlighting Appraisal Forms
10. Streetlighting and Accidents
Ref. Questionnaire by Mr. Yerrell
11. Miscellaneous
 - 11.1. Time and Place of next Meeting
 - 11.2. Any other business

Mr. Duff, Mr. Sarteel
Prof. Adrian

Annual Report 1972-73

CIE Study Group A - Psychological Problems in Lighting

A meeting was held at the University of Lund, in Lund, Sweden in conjunction with the 2nd International Architectural Psychology Conference. Attached to this report is a copy of the program for the CIE Study Group A part of the meeting. There is one error. Peter Kaiser, Psychologist was not a member of the panel, but he was a member of the audience during both the morning and afternoon session.

Sven Hesselgren, (Chairman S.C.A.) is attempting to organize another S.C.A. meeting to be held in conjunction with the International Association for Applied Psychology 18th Congress to be held in Montreal, Canada, July 28-August 2, 1974.

Peter K. Kaiser
Canadian Member S.C.A.

October 1, 1973

PKK:ga

Enclosure

2nd International

ARCHITECTURAL PSYCHOLOGY CONFERENCE

Including C.I.E. Study Group A

At the University of Lund Sweden June 26-29 1973

PROGRAM

Monday 25th

Registration

Tuesday 26th CIE STUDY GROUP A

Theme: NEW TENDENCIES IN LIGHTING RESEARCH

07.30

Breakfast

08.30

OPENING

Chairman: SVEN HESSELGREN, Professor, Tekn Dr,
Docent at the Royal Institute of Technology,
Stockholm

08.45

Invited speaker: CHRISTOPHER CUTLER, M Illum,
E.S., Scientific Research Officer at Pilkington,
Great Britain

THE SHARPNESS AND THE FLOW OF LIGHT

09.45

Refreshment

10.00

* LAARS SYTE, Research Assistant

GENERAL AND APPLIED RESEARCH ON COLOUR PERCEPTION
A REVIEW OF CURRENT SWEDISH PROJECTS

10.30

* ANDRZE HARG, Director

CONTEXT AND CONTRAST IN COLOUR

11.00

* DISCUSSION

12.15-13.30

Lunch

* Panel during the first part of the day, 10.00-12.15

ORHAN BOZKURT, Professor

PETER KAISER, Psychologist

ANDREW MICHAEL LUDLOW, Dipl Arch, MSc

LENA NUTH, fil kand

HARRIET RYD, Professor

PERCT SJÖBLÖM, Arkitekt SAR

Tuesday 26th
(Continued)

13.30 AHMET CAKIR, Dipl Ing

KEINE UNTERSUCHUNG ÜBER DIE PSYCHOLOGISCHE
BEWERTUNG BEI DER FARBFERNSEHGERECHTEN SPORT-
STÄTTENBELEUCHTUNG
(Including discussion)

14.14 * OSYR MAXTYNIUK, Associate Professor

EFFECT OF ENVIRONMENTAL LIGHTING ON IMPRESSION
AND BEHAVIOR

14.45 * HANS ALLAN LÖFBERG, civ ing

CURRENT RESEARCH ON THE INTERACTION OF LIGHTING
AND HEATING

15.15

Refreshment

15.30 * ANDERS LILJEFOHN, Arkitekt SAN

ON THE QUALITY OF LIGHTING

16.00 * Mogens VOLTELEN, Associate Professor

ON VARIOUS WAYS TO INSIGHT

16.30 DISCUSSION

17.30-18.30

Dinner

* Panel during the second part of the day, 16.15-17.30

PER WAKKE, Dipl Arch

W.F. LUMSDEN, Chief Lighting Engineer

HANS-DIETER SPILLE, Dipl Psych

19.00

EBBE CHRISTENSEN, SOPHUS FRANDSEN and Mogens VOLTELEN

PRELUDE TO LIGHT - A PICTURE REVIEW

CANADIAN NATIONAL COMMITTEE OF CIE, 1972/73

CNC/CIE Study Group B, 'Lighting and Architecture'
Annual Report by Canadian Member

In February, the President of CNC/CIE asked me to act as 'corresponding member' for Study Group B, for which the Secretariat is provided by South Africa. I wrote to the South African National Committee on Illumination shortly afterwards.

Since then I have received an acknowledgement from a Mr. Keith E. Gow and a copy of a preliminary report intended for consideration at the Annual General Meeting of the South African National Committee on Illumination. This includes:

- (i) a statement that the terms of reference should be widened to consider:
"how best the two professions - lighting engineer and architect - can work together to achieve their common aim to enrich and humanise the environment of man".
- (ii) a statement of proposed investigations:
 - i) the aims and objects of the work of each profession, which may be practised together and/or independently;
 - ii) all aspects of illumination, both natural and artificial, as applied to architecture;
 - iii) the training for this work, both formal education and practical experience and, thereafter, conditions of entry into practice for each group;
 - iv) influence and inter-relationship of existing lighting and architectural organisations overseas and, in the case of South Africa, such as the Institute of Architects (which provides for associate members from other professions), the Council for Professional Engineers, and other various engineering institutes, including I.L.E.S.A. and the Association of Consulting Engineers.
- (iii) a suggestion that 'the existing Technical Committees of CIE refer any problems with a bearing on architecture or aesthetics to it for comment, consideration or investigation!'.

Despite (iii) above, it seems clear that, at present, Study Group B is conceived by its Secretariat as a South African entity.

Peter Manning

Director, School of Architecture
Nova Scotia Technical College
Halifax, Nova Scotia, Canada

October 12, 1973

copy to: Mr. K.E. Gow, Durban, South Africa

August 21, 1973

Mr. M. E. Barthes,
Cie de Lamp,
11 Quai National,
92 Puteaux, France

Subject: C.I.E. Study Group "D" (Computers in Lighting)

Dear Mr. Barthes:

A few days ago I received your letter from Mr. A. R. Robertson, Secretary CNI/CIE regarding the subject group meeting in Paris next Fall. I also received your circular of May 18, 1973 to all National committees about the subject matter.

Presently, I would like to comment on both letters.

1. Due to my previous engagements I will not be able to attend the meeting in Paris.
2. The following are brief comments on your circular letter:
 - (a) We use the computer services from a private source which is run by a U.S. computer expert Mr. T. Roy Jones. The complete address is shown on attached sample of computer print-out sheet.
 - (b) I am not a computer expert but act only as an intermediary between manufacturers and computer expert. I explain the computer capabilities to our clients and extract from them all necessary data for computer input. When I obtain the computer print-out sheets, I explain them to the client. I also maintain very good contact with Mr. T. R. Jones due to continuously changing requirements and techniques.
 - (c) About 12 to 15 manufacturers use our services about 30 times a year. In our Laboratory we measure candle power data and maximum brightness (luminance) for computer input.
 - (d) We use computer mainly for calculation of interior lighting (efficiency, average luminance and coefficients of utilization). Very seldom we need computer for outdoor lighting (isolux curves, isocandela curves, point-by-point calculations and house or street side utilization factor).

Mr. M. E. Berthes

- (e) Some samples of print-out sheet are attached for your convenience. You will notice that one of them shows the complete application data of interest to architects or owners (illumination values, layout, luminance, cost of installation, ESI, LEF factor and maintenance schedule).
- (f) We would be interested to see some of the European computer print-out sheets for comparison of necessary input data and diversity of available programs.
- (g) Due to the relatively small volume of requests, we do not have a computer terminal and all information is handled through the mail.
- (h) Larger companies use computers in their main development centres (Sylvania, General Electric, Infranor, Philips etc) mostly for floodlighting of sports fields (for aiming and uniformity).

We hope that this information will be of some value to you and if you need any further comments, please do not hesitate to contact us.

Yours truly,

Z. Svoní Subotich, P. Eng.,
Photometric Group,
General and Industrial
Products Section,
Certification Division

ZSS:DN

cc: Mr. A. R. Robertson,
Division of Physics,
National Research Council,
Ottawa, Ontario
K1A 0S1