# MINUTES OF THE TENTH MEETING OF THE CANADIAN NATIONAL COMMITTEE OF THE C.I.E.

(Held at the National Research Council,
Ottawa, 29 October, 1965)

## PRESENT

Members:

- Mr. G.K. Brown
- Mr. W. Budde (Secretary)
- Miss M.G. Currie
- Mr. G.E. Davidson
- Mr. G.F. Dean
- Mr. W.F. Elliott
- Mr. D.W. Frick
- Mr. M. Galbreath
- Dr. C.L. Sanders (President)
- Mr. G.A. Watters
- Dr. G.W. Wyszecki

Guest:

Mr. F.A. Sweet, General Manager of the Canadian Standards Association.

## ABSENT

- Mr. E.H. Brezina
- Mr. J.M. Chorlton
- Mr. P.J. Foley
- Mr. R. Gingles
- Mr. E.I. Machtinger

In addition sent to Mr. Bateman

1. Call to Order

The President opened the meeting at 10:00 A.M. The following members had given notice that they could not attend the meeting: Messrs. E.H. Brezina and E.I. Machtinger.

2. Minutes of the Last Meeting

The minutes of the ninth meeting were read by the Secretary. A motion made by Mr. Frick and seconded by Mr. Watters that the minutes be approves was carried.

3. Secretary's Report

(a) The annual fee for Canadian membership in the CIE in the amount of U.S.$360.00 was paid by the National Research Council.

(b) At the last meeting it was decided that Mr. Brezina be asked whether he would be willing to serve as delegate for the CNC in case a CSA committee on Uniform Traffic Control Devices would be formed and a delegate from CNC be invited. Mr. Brezina declined: firstly because of a lack of background and practical experience in this field and secondly because as a civil servant of the province he might duplicate government representation.

(c) The 'Code of Procedure for Technical Committees', 2nd edition, has been received from the Central Bureau and distributed among members and delegates of the CNC. The

The Central Bureau being aware that 'the CIE has to adapt itself constantly to the rapidly changing conditions in the lighting field' hopes to be kept informed of our experience and invites our suggestions regarding the working methods and structure of the Technical Committees.

(d) The US-National Committee has formed a special committee for the preparation of the 16th Session to be held in Washington. A note from a letter: 'It seems to the US-Committee desirable that arrangements be set up early to establish lines of communication between our committee and prospective delegates to the Session. We suggest therefore, that you send us the names and addresses of persons whom your committee considers qualified for delegate assignments'.

(e) The Central Bureau has announced the publication of two new CIE Documents:

No. 12 International Recommendations for the Lighting of Public Thoroughfares.

No. 13 Method of Measuring and Specifying Color Rendering Properties of Light Sources (1st Edition).

Particulars of these publications can be seen in the copies of Circular Letter No. 133.

(f) In Circular Letter No. 130 (copies are distributed) the Central Bureau is giving some preliminary information on the reorganisation project of the Central Bureau.

(g) The Central Bureau has asked the Chairmen of the National Committees to invite prospective authors to

submit 'Individual Papers' suitable for presentation during the Washington Session. Since no country will be allowed to present more than two papers it is suggested that each National Committee convene a panel of authors and experts which will select suitable manuscripts to be forwarded to the Central Bureau.

Two deadlines are to be met:

1. By 6 June, 1966, six copies of a summary of each selected subject must reach the Central Bureau.

2. By 15 November, 1966, three copies of the complete text of the paper must readh the Central Bureau.

Miss Currie moved, seconded by Mr. Davidson, that the Secretary's Report be approved. The motion was carried.

3. Business Arising from the Minutes and the Secretary's Report.

Ref. (b) of the Secretary's Report. It was agreed that Mr. Elliott be named as delegate for the CNC in case the CSA should set up a committee on Uniform Traffic Control Devices. Mr. Elliott accepted this nomination.

Ref. (d). The Secretary proposed to send the list of all members and delegates of the CNC to the US-Committee as prospective delegates for the 1967 Session at Washington. Further nominations are being invited.

Ref. (f). In the discussion it was pointed out that the reorganisation of the Central Bureau

may approximately double the annual fee. Since this fee is paid by the NRC the CNC is obliged to consider very carefully the various solutions and corresponding budgets for the reorganisation project which will be forwarded to the National Committees for discussion.

It was agreed that payment of the annual fee by NRC is desirable in order to maintain the CNC being independent of financial control by other organisations - such as the IES.

Ref. (g). It was agreed that manuscripts for 'Individual Papers' should be sent to the President of the CNC who will select a referee to review the paper.

In further discussion on the Washington meeting it was suggested that the US-Committee be asked to expand the 'Entertaining Presentation of the Newest in U.S. Lighting' to the 'Newest in International Lighting'. This would be particularly desirable in connection with the survey presently made by the Technical Committee S-2.1. Sources of Visible Radiation. A motion, made by Mr. Watters and seconded by Mr. Davidson, that the Secretary of the CNC write a letter to the US-Committee suggesting this expansion was carried.

The President of the CNC was also asked to write a letter to the Assistant Secretary of the CIE pointing out that Canadian laboratories, whose work is closely related to CIE activities, invite individuals attending the 16th Session at Washington for a visit.

5. Discussion on the Cooperation between the CSA and the CNC/CIE.

(This item of the agenda was moved ahead at Mr. Sweet's request because of his other commitments for the afternoon).

The President reported on discussions with Mr. Sweet and Mr. R.E. Stopps, Technical Officer of CSA. Two problems had been discussed earlier and were open for discussion:

1. Should the CNC be affiliated with or sponsored by the CSA.
2. Is the CSA prepared to handle the distribution of CIE publications in Canada (even if the CNC is not affiliated with the CSA).

Mr. Sweet explained several ways in which the CNC could be affiliated with the CSA; e.g. the CNC could be established as a CSA steering committee for standardization work, or it could join forces with the IEC or ISO (which have a Canadian National Committee working under the auspices of the CSA).

In the discussion Mr. Frick pointed out the difference between the CIE and organisations such as the CSA, ISO or IEC. The CIE provides an international forum for the promotion and exchange of results of very basic research on the science and art of lighting. Recommendations resulting from such work are frequently guides on a very broad basis and in very general terms. They are recommended to national standardisation organisations, which have no or only limited research facilities, as being worth transformed into practical standards. Thus the CIE is not really in competition with national or international standardizing

organisations and neither is it fully compatible. Both types of organisations supplement one another but will probably serve their purposes better if they stay apart administratively.

It was agreed that at present a direct affiliation of the CNC/CIE with the CSA would not be advantageous. However, it was strongly recommended that Mr. J.C. Wilson, Chairman of the CSA Sectional Committee on Illumination, should become a member of the CNC. General information on the CIE should be forwarded to Mr. Wilson with a list of the members of CNC and their activities within the Technical Committees. The President agreed to take appropriate action.

The handling of CIE publications by CSA should be the subject of a formal written request with information on prices, frequency of new publications and the possible demand. This request should be addressed to Mr. Sweet who will present it to the Board of Directors for a decision.

Mr. Sweet also explained the procedure to be followed in order to establish a CSA standard.

6. Discussion of the Reports from Experts and Corresponding Members of the CIE Committees.

For Committees S-3.1.5, Mine Lighting, and S-3.3.6 Exterior Lighting Practice 'No activities' reports were received.

Mr. Watters explained that the second paragraph of his report is superseded by the actual publication of CIE

Document No. 12.

Mr. Galbreath mentioned that Committee E-3.2. Daylight, had issued an 'Informal report on the Measurement of Climatological Data necessary for the Study of Natural Daylight Problems', and suggested that this report be made available to the Meteorological Section of the Department of Transport. Mr. Galbreath agreed to forward a copy on behalf of the CNC.

It was pointed out that the reports from Experts and Corresponding Members serve the purpose as laid down in paragraph 1.7.4 of the Code of Procedure for Technical Committees: 'The National Committees are informed about the work of the Expert Committees by their representatives (whether experts or corresponding members) and by the Bulletin of the C.I.E.'.

It being 1:00 PM the meeting was adjourned until 1:40.

7. Appointment of New and Reappointment of Old Members

Mr. Elliott was reappointed as a member for another term of office by unanimous vote.

Mr. Chorlton's reappointment was discussed. Since Mr. Chorlton, due to other commitments, was unable to participate fully in the activities of the CNC for the last few years it was felt that the CNC was deprived of information on proceedings of the CIE Technical Committees of which Mr. Chorlton is a member. Miss Currie mentioned that Mr. Chorlton is highly interested in the CIE activities. Mr.Dean supported the argument that Mr. Chorlton's membership is highly desirable.

A motion to reappoint Mr. Chorlton as a member for another term of office was carried subject to Mr. Chorlton's approval.

A request by Mr. Davidson to be relieved from his activities as Corresponding Member for Committee E-2.2 (Characteristics of Lighting Materials) in favour of Mr. A.T. Orr of Orr Consolidated, Toronto, was discussed. Mr. Davidson mentioned that Mr. Orr is willing to take on this assignment. It was agreed that the President write a letter to Mr. Orr inviting him to become a Delegate for E-2.2.

Mr. Frick proposed the appointment of Mr. Earl Rider as Delegate for E-3.1.1.2, Causes of Discomfort in Lighting. Mr. Dean seconded this motion, which was carried.

Mr. Dean moved that, as discussed before, Mr. C. Wilson be made a member of the CNC. Mr. Davidson seconded the motion which was carried unanimously.

8. Discussion on the Proposed new Statutes of the CIE

Copies of the proposed Statutes had been distributed before the meeting. After some discussion of minor details Mr. Dean moved that the CNC approve the new Statutes. Mr. Watters seconded the motion which was carried unanimously.

9. Other Business

The Secretary announced that the British IES has invited members of the CNC to attend the Summer Meeting to be held at Harrogate from 16 - 18 May, 1966. Further detailed notices will be distributed among the CNC members.

The Secretary read the draft of a press release. In the discussion it was pointed out that the CNC is not widely known in Canada and that more publicity is desirable in order to have a stronger platform for the introduction of CIE work into Canada.

Dr. Wyszecki mentioned that the exchange of speakers to meetings of other associations should be promoted. In particular at regional sessions of the IES or at the National Conference of the IES (to be held at Montreal in 1966) a large audience can be acquainted with the activities of the CIE.

There being no other business Mr. Davidson extended an invitation that the next annual meeting be held on Friday 28 October, 1966, at the Research Division of Ontario Hydro, Toronto. Mr. Elliott moved, and Mr. Watters seconded, that this invitation be accepted and the motion was carried.

Following an invitation by Mr. Frick the members visited the lighting installations in the new CBC Headquarters Building, 1500 Bronson Avenue, Ottawa.

15 November, 1965.

Nov. 5/65.

# CSA SECTIONAL COMMITTEE ON ILLUMINATION.

Mr. J. Carl Wilson, P. Eng.,
President,
J.A. Wilson Lighting Ltd.,
2200 Lake Shore Blvd. W.,
Toronto 14, Ontario.

Mr. C.A. Albini,
CIM Industries,
McGraw-Edison (Canada) Limited,
3795 St. Clair Avenue East,
Scarborough, Ontario.

Mr. A.C. Calderone,
Amalgamated Electric Corp. Ltd.,
Box 1200,
Markham, Ontario.

Mr. T.H. Doherty,
Lighting Sales Manager,
B.C. Hydro and Power Authority,
970 Burrard Street,
Vancouver 1, B.C.

Mr. M.B. Hastings,
Sylvania Devices Limited,
54 Atomic Avenue,
Toronto, Ontario.

Mr. E.H. Lindsay,
Vice-President,
Canadian General Electric Company Limited,
165 Dufferin Street,
Toronto 3, Ontario.

Mr. M.J. McAuliff,
Canadian Westinghouse Company Limited,
Granby, Quebec.

Mr. C.D. McCaig,
Supplier Relations Manager,
Marketing Service Division,
Northern Electric Company Limited,
P.O. Box 6123,
Montreal, Quebec.

Mr. R. Maynard,
Lighting Specialist,
Southern Canada Power Company Limited,
1450 City Councillors Street,
Montreal 2, Quebec.

Mr. L.H. Ritenburg,
President & General Manager,
L.H. Ritenburg and Associates Ltd.,
Consulting Engineers,
Ste. 2A - 2700 Montague Street,
Regina, Sask.

Mr. R.G. Scott,
Asst. General Sales Manager,
B.C. Hydro and Power Authority,
970 Burrard Street,
Vancouver 1, B.C.

Mr. J. Thomas,
Supervisor, Lamp Sales, Lamp Department
Canadian General Electric Company Limite
3707 Howe Avenue,
Halifax, N.S.

Mr. I.S. Widdifield,
Manager of Commercial and Industrial Sales,
The Hydro-Electric Power Commission of Ontario,
620 University Avenue,
Toronto 2, Ontario.

Mr. G.W. Wyszecki,
Division of Applied Physics,
National Research Council,
Ottawa 2, Ontario.

# P R E S S  R E L E A S E

The Canadian National Committee of the International Commission on Illumination (CNC of CIE) held its tenth annual meeting at the National Research Council, Ottawa on October 29, 1965.

The purposes of the CIE are:

(a) to provide an international forum for all matters relating to the science and art of lighting;

(b) to promote by all appropriate means the study of such matters;

(c) to provide for the interchange of lighting information between different countries;

(d) to work out and publish international agreements in the field of lighting.

The President of the CNC, Dr. C.L. Sanders, welcomed the new members who had been appointed since the last meeting. These were: Mr. G.F. Dean of the Toronto Hydro Electric System, a former president of the Illuminating Engineering Society; Mr. M. Galbreath, Building Research Division of NRC; and Mr. P.J. Foley, Defence Research Medical Laboratories, Toronto.

Main topic on the agenda was a discussion on a closer cooperation between the CNC and the Canadian Standards Association (CSA). Mr. F.A. Sweet, General Manager of the CSA was present for this discussion.

.....2

The results may be summarized as follows: Mr. C. Wilson, Chairman of the CSA Sectional Committee on Lighting has been elected as a member of the CNC to provide liaison between CSA and CNC/CIE. The CNC will make a request to CSA that all CIE publications be stocked and sold in Canada by CSA.

The publication by the CIE of two new international agreements was announced:

CIE Document No. 12: International Recommendation for the Lighting of Public Thoroughfares.

This publication is not only meant for engineers specialized in public lighting, but also for road technicians who, on an urban or national plane, are entrusted with the construction and maintenance of streets and roads as well as traffic problems.

CIE Document No. 13: Method of Measuring and Specifying Colour Rendering Properties of Light Sources.

This recommendation considers the ability of light sources, such as fluorescent lamps or high pressure mercury arcs, to make the colors of objects appear natural.

Until further notice these recommendations and other CIE Documents (listed below) are available from:

Mr. L. E. Barbrow,
Secretary, United States National Committee,
c/o National Bureau of Standards,
Washington 25 : D.C. : U.S.A.

.....3

List of 'CIE Documents' now available:

| No. | Title |
|---|---|
| 1 | International Lighting Vocabulary (2nd ed.) Vol. 1. |
| 2 | Colour of Signal Lights. |
| 3 | International Lighting Vocabulary (2nd ed.) Vol. II. |
| 8 | Street Lighting and Accidents |
| 9 | History of the CIE |
| 10 | Slides for Lighting Education with Commentary (1st Series) |
| 11 | CIE Proceedings, Vienna 1963 (4 Vol. 11A to 11D) |
| 12 | As above |
| 13 | As above |

List of 'Informal Reports' now available:

| | |
|---|---|
| 1 | Informal Report on Predetermination of Illumination and Luminance (1962). |
| 2 | Informal Report on Terminology of Color Rendering (1964). |
| 3 | Informal Report on the Measurement of Climatological Data for the Study of Natural Daylight Problems (1964) |

Further information on the CNC of CIE may be obtained from the Secretary:

Mr. W. Budde
Division of Applied Physics,
National Research Council,
Ottawa : Canada.

# REPORT ON ACTIVITY IN CIE COMMITTEES

## E-1.2 AND E-1.3.2

By

C. L. Sanders

## E-1.2. MEASUREMENT OF LIGHT

The committee has been very active in the past year, both in correspondence and at a three day experts meeting held in Paris in September.

During the year replies have been prepared to questionnaires on Physical Receivers - both spectrally non-selective and spectrally selective. Regarding the latter a specific suggestion was made for an international comparison of the measurements of spectral sensitivity of RCA 6217 photomultipliers. At the Paris meeting this suggestion was approved in principle but photocells of the type VB 59 made by Rank Cintel were substituted for the photomultiplier type. NRC has accepted the task of organizing the comparison, intercomparing all the cells before and after other laboratories measure them, and analysing the results.

I have prepared a first draft of a proposed CIE publication which will include all CIE recommendations on Measurement of Light and some history and comment on these recommendations. In its final form this pamphlet will be useful as a reference since it will collect, coordinate and update all previous CIE recommendations on this subject. I have accepted the task of writing the second draft using the comments received on the first draft.

The committee also decided to undertake an intercomparison of reflectance standards. These will be in two forms; opal glass, glossy and matte, and MgO pressed in a Zeiss press. The laboratories will intercompare these and will also measure the absolute reflectance if possible. This program should be a good step toward

getting agreement on reflectance standards. Dr. Kartashevskaya from the U.S.S.R. will coordinate this work.

## E - 1.3.2. COLOUR RENDERING

This committee has not been very active in the past year. An expert committee meeting was held in Switzerland at the end of May which Dr. Wyszecki attended since he was in Switzerland for the Colorimetry Committee meeting. The work has consisted mainly of editing the CIE recommendation 'Method of Measuring and Specifying the Colour Rendering Properties of Light Sources' following the suggestions made by the National Committees when they voted on this document. Consideration is being given to finding the tolerances which apply to the results obtained using this method. Abbreviated methods for routine testing are also being studied.

15 October, 1965

ADRESSE TÉLÉGRAPHIQUE "RESEARCH"
NOTRE DOSSIER .....

CABLE ADDRESS "RESEARCH"
OUR FILE .....

NATIONAL RESEARCH COUNCIL
CONSEIL NATIONAL DE RECHERCHES
CANADA

DIVISION DE PHYSIQUE APPLIQUÉE
OTTAWA 2

DIVISION OF APPLIED PHYSICS
OTTAWA 2

18 October, 1965

Mr. W. Budde,
Secretary, Canadian National
Committee on Illumination,
National Research Council,
Ottawa : Ontario.

Dear Mr. Budde:

Re: Report on Activities of CIE Committee E-1.3.1 (Colorimetry) for the period October 1964/ October 1965.

The main item during the above period was a meeting of E-1.3.1, held at Basle, Switzerland, on May 28, 29. The meeting was well attended and a number of problems were resolved. The agreement covered two recommendations:

(1) The final version of revisions for the new Vocabulary dealing with Color Vision and Colorimetry.

(2) Spectral energy distributions for new standard light sources.

Details of the meeting can be obtained on request.

Yours very truly,

Günter Wyszecki
Member of CNC/CIE Committee

COMMISSION INTERNATIONALE DE L'ECLAIRAGE

COMMITTEE E-1.3.3, SIGNAL COLOURS

Minutes of a meeting of the Committee held at the laboratories of NV KEMA at Arnhem, Holland, on Friday, 16th July 1965, commencing at 0930 hours.

Present: Dr. B.H. Crawford, Great Britain Chairman

| | | |
|---|---|---|
| Mr. W.F. Elliott | Canada | |
| Prof. P. Jainski | W. Germany | |
| Mr. R. Pagès | France | |
| Prof. G.A.W. Rutgers | Holland | |
| Mr. G.E.V. Lambert | Great Britain | Secretary |

Mr. F.M. Oberstadt, representing the secretary of ISO Committee TC80, Safety Colours, attended by invitation.

The agenda for the meeting had been circulated to all members with a letter from the secretary, dated 17th May 1965.

The following also were distributed at the meeting:-

(1) Summary of replies from national committees to circular letter concerning working programme etc., issued to members in November 1964.

(2) Copies of chromaticity diagram giving colour regions used in Japanese Industry Standards JIS Z9101, General Code of Practice, and JIS W8301, Colours for Aeronautical Ground Lights and Surface marking (both sent by the Japanese National Committee through their corresponding member).

(3) CIE draft recommendations plotted on the u.v. uniform chromaticity diagram.

(Note: Decisions by the committee are double underlined.
Actions to be taken by members underlined with a broken line.)

The chairman in opening the meeting welcomed those present, and then referred to the agenda.

He said that he wished to deal first with the items related to CIE Publication No. 2, and accordingly proposed commencing with item 3.

1. Revision of Boundaries recommended in CIE Publication No. 2. Colours of Light Signals (Item 3 of Agenda)

The chairman summarised the present situation by saying that there were comments from a number of quarters that the limits set in this document were generally not sufficiently restrictive, in particular in the green region, which was considered first. The question was then whether we should modify the boundaries to restrict the areas further, and in doing so consider assisting observers who are colour-defective. It was noticeable that on railways, according to DIN, ASA and British Standard Specifications, restricted areas were in use, especially in relation to the green region. Therefore, should the CIE alter its boundaries, and, if so, how?

Green Signal Colours

Prof. Jainski gave the following reasons why the more limited areas were adopted for DIN specifications. (1) To keep the manufacturer's tolerances as small as possible. Manufacturers in 1959 asked for wide tolerances but last year they said that they could work to smaller ones. (2) Tests with red, green and white colours showed that if the boundaries were wider there was risk of confusion with white. (3) Within street signal lanterns only one type of illuminant is used, tungsten lamps, and the relevant colour areas can therefore be kept small, and for different purposes different areas were specified, e.g. for level crossings and street signals. There are eight sheets altogether. The colour regions actually used by German railways were smaller than given in DIN; for Illuminant A in the green region it is a small, nearly square area within the wider areas specified for more general use.

Prof. Rutgers pointed out that there was a large region of green towards yellow that was not used in other specifications.

The chairman noted that in DIN for air travel signal lights and in ASA Handbook 95 for aeronautical ground lights, the wider limits are allowed ("Green A" in the former and the full CIE limit in the latter).

Prof. Jainski referred to DIN, sheet 7, where Red A, Blue A, etc., were as for CIE, but for Green Germany preferred "Green D".

M. Pagès recalled that at Zurich (1955) the areas were thought to be too great, but referred to a paper by Blaise. He emphasised that the yellow boundary was in an area where there was maximum transmission for the glassware, which was important in marine use. He thought that it is best to have two zones, one restricted for use on railways and a wider one to cover marine use. For road transport, colour is not so important but intensity is. It is necessary to see signals at a distance, 300 metres or so, and recognition of colour is important only at shorter distances. Restricted colours mean low transmission, perhaps one half of the maximum; plastics are only a little better than glass. A smaller zone for green is only necessary when there is great risk of confusion with white, not with yellow, and perhaps there might be different boundaries according to whether the system was red-white-green or red-yellow-green.

The chairman said that M. Pagès' point could be taken care of by retaining the present boundary and having also a more restricted one, which might be a little wider than in DIN but which could be much restricted for critical conditions. Referring again to the various railway specifications he remarked that the British and German green regions were very similar, and that the ASA is restricted towards yellow and blue, but not towards white. It seems that where green has to be seen on its own, restricted colours are necessary, but if it is seen at the same time as or closely following other colours wider limits may be used.

Prof. Jainski remarked that agreement on railway requirements would not be unexpected, for the illuminant was generally the same on most railways.

M. Pagès added that also the observers involved on the railways were few in number, whereas on the roads everyone was concerned, and intensity was here more important than colour. Green was only subject to confusion at night time when other coloured lights were in the field of observation, and even then it was often under circumstances where the situation could be inferred from other factors. For example the presence of a cross-road was often revealed in France by the fact that sodium discharge lighting was installed there, and the colours of signals at the junction were important, mainly at short distance. M. Pagès asked Prof. Jainski concerning the restricted yellow boundary, and was informed that it

was to assist colour defectives. Prof. Jainski said further that we should not change the present yellow boundary completely, for perhaps there were some of the recently formed or developing countries which had been working to the present limits, and it would be inconvenient for them to change. (Secretary's note: In United States Handbook 95 as previously noted, yellow limit for "signal Green" is identical with the CIE yellow limit of green). The chairman said that members seemed generally agreed on the white limit, but there were conflicting viewpoints regarding the yellow limit. If we made any change it would not be a very large one in practice because it could, in effect, only apply to the more desaturated colours away from the spectrum locus. Those near the locus were impracticable because of their associated low luminosity. He proposed that we should leave the present outer limit but put in the CIE publication No. 2 two restricted areas, one for use when green has to be alone, and one intermediate to this and the widest area for use when it is seen in association with other colours. He and the secretary would draw in the areas on the colour diagram from consideration of the existing specifications and indicate the applications in the text. This was agreed.

Red signal colours

The chairman said that it was not difficult to achieve a good red colour with an adequate transmission, except perhaps for copper flashings.

Prof. Jainski and M. Pages said that they use only selenium glasses.

Prof. Jainski noted that there is already a restricted red in the CIE recommendations. Would it be better to treat red as we had suggested for green, e.g. describe "railway red", "traffic red"? We should not alter the present limit.

The chairman. Perhaps we should leave the red limits as they are, but give further explanation as to what the restricted area was intended for.

Prof. Rutgers said we should not give too much explanation but leave the various national specifications to define areas for individual requirements.

M. Pages re-stressed the importance of having ample intensity in some applications, involving less-saturated colours to maintain good transmission.

The chairman, summarising, said we ought to leave the red limits as they are but

amplify the explanation as to their use. This was agreed.

Yellow signal colours

Prof. Rutgers said there were very good yellows obtainable from the USA which are beyond the green limit. Would this be a reason for extending this limit?

M. Pagès mentioned a recent American limit for use in connection with automobiles, which was not referred to in Handbook 95.

The chairman pointed out that the American restricted yellow region gives preference to less red yellows. Is there any other evidence that the green limit could be widened?

Prof. Rutgers said he thought there was no scientific reason for making a change of this nature and the present area allowed enough choice according to whether an orange-yellow or greenish-yellow was needed. The green boundary of yellow in USA Handbook 95 extended outside the CIE boundary.

M. Pagès said we should not consider Carbon yellows, and the CIE limits do not permit their use.

The chairman, summarising, said the general view was that we should not alter yellows. Agreed.

Blue Signal Colours

Prof. Jainski said that USA Handbook 95 and D.I.N.6 for blue lights on ships gave narrower limits than the CIE. The restricted blue was used on Rhine ships carrying special loads, for example explosives. The blue was important for this purpose and the restricted colours were useful, but he agreed that this special use was probably not very important for the CIE. Very deep blues near the spectrum locus were not practicable. The wider blue region was chosen for visibility in daytime and at night, for example for ambulances etc.

M. Pagès mentioned that plastics can give a good blue colour between the white limit of blue and the blue limit of white, but the copper and cobalt glasses transmit too much red for this. He asked whether the committee would be interested in this area for flashing lights for ambulances etc.

The chairman replied Yes, but would like M. Pages to write a note about it for the committee.

2. Extension of Blue for Special Purposes (Item 6 of Agenda)

The chairman then mentioned correspondence from ISO TC 22 and CIE/E-3.3.5. concerning the colour of blue tell-tale lights for automobile headlights. This stated that the CIE limits were considered to be too restrictive by TC22/E-3.3.5. and asked for the views of E-1.3.3. Chromaticity values submitted by the Italian industry were

(a) x = 0.148 y = 0.202

(b) x = 0.157 y = 0.191

(c) x = 0.128 y = 0.208

These were stated to have been proved quite satisfactory.

M. Pages considered that this was not a safety colour in any real sense; it was only used as an indicator.

The chromaticities quoted were very near to and almost adjoining the CIE green boundary. One was almost on the boundary.

The general opinion of the committee was that ISO should be asked to suggest that the colours used should be confined to those that did conform to CIE. There would not then be any need to extend the region.

White signal colours

The chairman asked for comments, and remarked that this region seems to be treated very thoroughly by the Americans.

Prof. Jainski referred to the remarks on white in a 3-colour system in CIE publication No. 2, p.14. The yellow-white colour was a good intermediate colour, but there seemed to be no suitable name for it. In USA Handbook 95 the blue limit was outside the CIE boundary and included blue white.

M. Pages wondered why the yellow and white regions were contiguous.

There was some discussion on this region, from which emerged a general opinion that the yellow boundary should be set at the colour of a black-body at 1900°K, as this was the lowest colour-temperature obtainable with ordinary illuminants and corresponded to an oil flame.

It was noted that the green and purple boundaries in the USA specification, Handbook 95, ran parallel with the black-body locus, but Dr. Jainski said the width (green to purple) in the CIE white region allowed for the use of propane gas flames.

The chairman said that we would ask Mr. Holmes about the yellow limit beyond 1900°K.

3. Purple Signal Colours (Item 4 of Agenda)

There were many difficulties in the use of this colour, the colour could change through atmospheric absorption, and should not be viewed at a distance, optical projection systems needed chromatic corrections, and different illuminants had a large effect on the transmitted colour.

The chairman said there was agreement that we should add to paragraph 425 of CIE Publication No. 2 indicating what the various difficulties were.

4. Identification of Signal Colours by Colour Defectives (Item 5 of Agenda)

For those with serious defects of colour vision it was considered to be impossible to select enough distinguishable colours, and it would be necessary to resort to the use of shapes to achieve a similar result. This problem then comes within the province of E-3.3.7.

The only action recommended is that the paragraphs in CIE Publication No. 2 dealing with defectives should be brought together. Reference was made to a paper by Nathan Henry and Cole on this subject. Further consideration of the paper should be given at the next meeting.

5. The use of the CIE recommended (u.v.) uniform chromaticity diagram, or other similar diagram (Item 7 of Agenda).

The chairman described the differences between the u.v. and RUCS diagrams. The CIE signal colour limits are given in Publication No. 2 on the latter diagram but the question was - should we now change to the u.v. system recommended by the CIE.

Prof. Jainski questioned whether it was our job to recommend a diagram. Different diagrams involve visualising colours in different ways and there was a risk of causing confusion.

The chairman explained that the u.v. diagram was recommended by the CIE. Uniform chromaticity charts do show better uniformity of size and spacing of the colour regions than the standard CIE diagram.

Prof. Rutgers recollected that the u.v. diagram was put forward for consideration by national committees, but CIE reports do imply that it is now adopted.

M. Pages pointed out that the diagrams are not necessarily suitable for either point sources or extended surfaces, but are only a compromise. The various researches by Wright MacAdam etc. give results roughly in agreement with the expressions for these u.c.s. diagrams. The chairman asked whether there was general agreement on the adoption of the u.v. chart in place of the Breckenridge and Schaub RUCS chart.

Members were in favour of the change. It was also preferred that the boundaries should be specified by the co-ordinates of the points of intersection of the boundary lines rather than by equations to the lines.

Intersections with the spectral locus could not be derived by solving equations, and it was thought best to derive these points by graphical methods using closely tabulated wavelength-chromaticity values. Such interpolations between values in standard tables had probably been evaluated already and could in this case be obtained from one source or another. Dr. Hunt, of Kodak, England, was suggested as possibly having made the interpolations, and he should be asked about them.

6. Surface Colours for Signals (Items 1 and 2 of Agenda)

The chairman explained the historical background of the draft recommendations put forward to the CIE at Vienna in 1963, and made reference to comments on the draft which had been made in several quarters. The chief of these was a request that experimental evidence should, if possible, be presented for examination. This Prof. Jainski had now produced in the paper which he presented at the Sixth International Technical Conference on Lighthouses and Other Aids to Navigation. The draft also takes account of the specifications laid down by ICAO, ISO and ASA. Comments from other members of the committee were noted in the list distributed at the meeting.

Prof. Jainski referred to this list, and said that the comment from the United Kingdom that measurements appear to have been made mainly on one day was a

misapprehension. The observations in fact extended over one year. He explained that the recommended colours were only strictly applicable to signs, not necessarily to buoys, etc., and what factors were taken into account to decide on them. He thought that the title of the specification should read "Draft Recommendations for Surface Colours for Traffic Signs". Fluorescent materials change very much according to the illuminant. The colour boundaries were true for Illuminant C, but if other illuminants were used and the colours of surfaces for signs were found to lie outside the appropriate area the illuminant must be changed to bring the surface colour inside the boundaries.

M. Pages said he thought that the changes that could occur with possible illuminants would be too great and the form and design of the sign were more important. Illuminant C might be satisfactory for aviation signs but on the roads it was a different matter. We could ask Committee E-3.3.7 for colours to give good discrimination. The problems of signalling with self-luminous signals and with surfaces are completely different. For the former the colour is the fundamental property and in the majority of cases it serves alone to provide identification. The signal is often viewed at a very small angular subtense. For panels, on the contrary, the message is given almost exclusively by the exterior form and design, and colour is only an aid to understanding the meaning. Such is the case in particular for traffic routes and in town. Otherwise signals would be unusable at night on routes illuminated by sodium lamps. For good legibility of the signal the contrast between its different parts must be as great as possible. Colour could help in the achievement of this contrast. In the case of panels another aspect of the problem must be considered. In daytime the illuminant is natural and approximates to Illuminant C. The luminance of the panel is of the same order as or inferior to that of the surroundings. At night the panel is illuminated by incandescent light (with or without a yellow filter), by different types of discharge lamp including sodium. The change in appearance is very important but identification must always be possible. Moreover, if the panel is reflectorised and if the observer is the driver of a vehicle whose headlights illuminate it, it takes on a luminance much in excess of that of the background, whence an important

modification of the visual conditions arises, approaching in this case those of self-luminous signals of large dimension. We note, however, that for marine use it is otherwise. The buoy or the sea are often used at the limits of range. Form becomes secondary. The message conveyed is, besides, much simpler than in the case of road signals. It is sufficient to distinguish "something" by eye or with binoculars and one has a certain amount of time for recognition. Colour regains its importance but more in the sense of contrast formed with the background rather than in the distinguishing of colour. This may be such that if the background colour is liable to change it is essential to use two-colour buoys: black/green or black, blue and yellow, for example. This complexity of the colour question for panels (surfaces) and buoys and the fundamental difference that exists between them and self-luminous signals, as we have endeavoured to demonstrate, must have repercussions on regulations for surface colours.

M. Pagès summarised thus:

(1) The colour is the fundamental element for identification of a buoy. The experiments of Dr. Jainski constitute an excellent basis for a specification and the actual draft of E-1.3.3. may be adopted.

(2) The colour of the buoy and its contrast with the background operate simultaneously.

It is essential to study from the first the colour of this background if this is well defined (sea and sky) and the colours of the buoy should be determined as a function of this study. M. Blaise has presented to the 1965 Congress on lighthouses and buoys a paper on the subject.

(3) Form is the fundamental element, colour only enters as an accessory.

We think it is equally useful in this instance to give directions to users, in particular in the grouping of colours in pairs.

The areas defined will be sufficiently large.

Prof. Rutgers said that our job is to define the areas of the colours used with the illuminant, not to consider different illuminants. The chairman agreed. He said that we have to limit ourselves in aim and possibilities, and to proceed

further in the direction M. Pagès described necessitated collaboration with E-3.3.7

He referred to a diagram of colour areas for surface signals which had just been received from the Japanese National Committee, and their comments on the draft.

The samples they sent were also examined by members, who in general said that they considered the colours somewhat too dilute.

Prof. Jainski said that he and his colleagues had satisfied themselves before drawing up their specifications that German manufacturers would be able to produce the desired colours, and that these would have a life of two years.

M. Pagès said there was some difficulty in manufacturing the colours. Fluorescent colours had poor durability. Scotch-lite was another problem. He suggested that samples from different sources might be sent to E-1.3.3.

The chairman said that the English Paint Research Station had information on British Standard colours, including permanence. We have also received some Swedish colour samples with some information about them. With these various documents and samples we should be in a better position to issue a revised draft.

Mr. Oberstadt said that the draft recommendations had been found to be satisfactory.

M. Pagès raised the question of accuracy of measurement.

The chairman said that the conditions of illumination and view were very important for this. For dark colours it made a very large difference whether CIE conditions or diffuse illumination was used, particularly if the surface were glossy. He suggested that the colours used by Prof. Jainski might be measured under both conditions. Out of doors, the illumination is diffuse, but Prof. Jainski said his measurements had been made with $45^{\circ}$ illumination and $o^{\circ}$ view (Illuminant C). The chairman thought that we could not make a decision on this matter today, but we should try and collect more information. We should mention the conditions in the draft and state that the question of the correct conditions is being investigated. As regards the effect of illuminant the chromaticities should always lie within the areas specified, whatever the illuminant.

On the question of surface finish Prof. Jainski showed his colour cards which were considered to be semi-matt. Mr. Pages' samples were glossy.

The chairman said that, considering the opinions put forward, it seemed that the committee had in the main accepted Prof. Jainski's draft proposals. There were some modifications to the text, but not to the boundaries, as there were no further experimental results. Prof. Jainski's modifications* were to be incorporated in the draft. There were also some points regarding legibility which might be considered by E-3.3.7, on which M. Pagès would provide a note.

*These are:

I. Title to read " ... for surface colours for signs and signals"

II Section 4 of Draft Recommendations

II (1) The last paragraph of this section to be amended as follows

" ..... ample certainty of recognition 'if they are illuminated with Standard Illuminant C, and' if .....".

The portion between the marks ' ' is to be added and the whole paragraph moved to follow the first paragraph of this section, which ends " ..... purple with blue or red".

II (2) The paragraph commencing "non-self-luminous signals" is to commence a new section thus

"5 Changing of Chromaticities.

Non-self-luminous signals ..... also changes. 'Such changes are admissible if the chromaticities lie within the colour boundaries given in Section 4 or within the colour boundaries published in CIE publication No. 2 (W-1.3.3) 1959. If this is not possible such signs must be illuminated by a special lighting fitting with a suitable light source' ".

The portion between marks ' ' is to replace the present ending to this paragraph "such changes ..... every light source to be used".

Prof. Jainski, in reply to a question about the method of use of his control card system, said that the first chart was made by Dr. Richter, who had said that he could make cards for points on the boundaries of the colour regions of the draft, but Prof. Jainski was doubtful about this and had not pursued the matter.

7. Other business (Item 8 of the Agenda)

(1) Mr. Elliott said that during a meeting of another committee it was suggested that a note be sent of decisions reached by, amongst others, E-1.3.3.

In discussion members expressed the view that E-1.3.1 (Dr. Wysecki's) and E-3.3.7 should have copies of our minutes, and also ISO Committee TC 80, Safety Colours. Prof. Jainski at this point said he thought that ISO limits were not necessarily final, but could be subject to compromise.

(2) Mr. Oberstadt raised the question of contrast with the background. Prof. Jainski said he was investigating this point. (Secretary's note: The Japanese National Committee also had promised to send papers on this subject.)

(3) Addition of black region for surface colours

Prof. Jainski said that ISO had a "white" area but with a luminance factor of only 2.5 per cent.

M. Pages emphasised the importance of the directions of view and illumination. He thought that we should add black.

The chairman said that, as regards the boundaries, we had only ISO values to draw upon.

The general opinion was in favour of adding black. (This was also the view of the Japanese Committee.)

(4) Next meeting.

This was considered by the members. A convenient time was thought to be in April-May of next year, possibly in Coblenz or Paris. It would be useful to check on the CIE timing in connection with the 1967 session.

CIE COMMITTEE E-2.1.2

SOURCES OF UV AND IR RADIATION AND MEASUREMENT

One meeting was held in Stockholm on 22 June, 1965. The two important items of the agenda were discussed as outlined in the enclosed copy of page 2 of the Minutes.

The draft of the report mentioned under item No. 2 will be submitted to the experts and corresponding members for their comments after the English and the French versions have been prepared.

W. Budde

W. Budde
Member of CNC/CIE

19 October, 1965

1. The Chairman reported that the draft "Recommendation for the spectral distribution and the integrated irradiance of artificial extraterrestrial solar radiation for testing purposes" was forwarded to the members of E-2.1.2 and to the Scope Committee for their comments. No remarks were received.

   The American expert E. Nagy advised in writing that the value for the solar constant is only probably accurate within $\pm$ 5 % instead of $\pm$ 1 %. The Belgian representative R. Pastiels asked for the same reasons to delete the tolerance of $\pm$ 1 %. After discussion it was decided to indicate an estimated tolerance of $\pm$ 3 %.

   The American expert R. Nagy will be asked to contact the "Committee E-21 (Space Simulating) of the American Society for Testing Materials (ASTM)" and the "Solar Radiation Committee of the Institute of Environmental Sciences" which deals with similar questions. The draft of the recommendation will be decided upon at the next meeting of E-2.1.2.

2. The draft of the report "Recommendation for the spectral distribution and the integrated irradiance of artificial global radiation for testing purposes" was circulated in German and English and discussed in details. In this report the term "global radiation" is defined as the total of direct solar radiation and celestrial radiation, measured by a plain and horizontal receiving area. For the spectral distribution of the global radiation calculated values given by Hinzpeter are available. These values are adapted to those given by Johnson for the spectral distribution of the extraterrestrial solar radiation. The committee of experts E-1.3.1 of the CIE recommended as spectral distribution of medium daylight in the range 0,3 µm to 0,8 µm a distribution of $D_{6500}$, which is an average of many measurements. The relative spectral distributions are in agreement, excepting small deviations in the UV-range. E-2.1.2 recommends to take the distribution $D_{6500}$, indicated by the committee E-1.3.1, as a basis for the spectral distribution of global radiation in the range 0,3 µm to 0,8 µm. For extension to the infra-red spectral range the values of Hinzpeter are recommended. These values are given in tables and curves, divided in narrow and broader spectral ranges.

# Report on CIE Committee Activities for 1965

G.E. Davidson, P.Eng., FIES
Member CNC/CIE

## Committee S-2.1.1 on Sources of Visible Radiation

Late last month, a letter was received from the Japanese Committee on Illumination, as Secretariat, requesting information on the progress of light sources from which to prepare a general report for presentation in June, 1967. These data have been requested by March 31, 1966.

Letters are being sent out to the Canadian Lamp manufacturers requesting their cooperation in providing the necessary data.

## Committee E-2.3 Photometric Requirements on Luminaires for Fluorescent Lamps

No formal meetings have been held by this Committee, as all matters have been dealt with by correspondence.

Replies to the questionnaire submitted by the Secretariat were forwarded and a most interesting document collating and summarizing the answers and comments submitted has been received.

A draft recommendation is being completed by the Secretariat on the photometry of luminaires with tubular fluorescent lamps, having in mind the special requirements of IEC Committee TC34D. It is not known when this draft will be issued to the members, for their written comments.

## Committee E-2.2 on Characteristics of Lighting Materials

A meeting of this Committee was held in Paris on April 21 and 22, 1965. The following Provisional Documents distributed before the meeting were discussed.

1) Quantities affecting the spectral and light characteristics of illuminating engineering materials.

2) Definitions of spectral characteristics of illuminating engineering materials.

3) Definitions of light characteristics of illuminating engineering materials.

4) Measuring methods for spectral and light characteristics of illuminating engineering materials.

Committee E-2.2 on Characteristics of Lighting Materials (continued)

It was decided to introduce a number of alterations into these documents.

It is hoped that it will be possible to draft a CIE recommendation on these items before the next Plenary Sessions of the CIE.

Committee E-1.1 on Definitions and Vocabulary

The activities of this Committee have continued at a reasonably high level during the past year.

A meeting was held in Budapest on May 17 to 21, 1965 in conjunction with the annual Spring meeting of the Hungarial National Committee. It was not practicable for the writer to attend.

Since 1960 this Committee has been engaged in the preparation of the 3rd Edition of the International Lighting Vocabulary (CIE and IEC). The writer was appointed to this Committee in the Spring of 1964 and his activities have been hampered somewhat due to a lack of knowledge on what went on prior to his appointment.

Several specific definitions are the subject of considerable discussion and these have not been resolved yet.

C.I.E. COMMITTEE E-3.1.1.1 PREDETERMINATION OF ILLUMINATION AND LUMINANCE
1964-1965

The Committee is still very actively engaged in their study of the methods of calculating flux and illumination in interior lighting with the view to establishing a C.I.E. Method agreeable to all the members. A copy of a paper entitled, "Method for Calculation of Flux and Illumination in Artifical Lighting of Rooms", by J. Dourgnon and A. Godfert of the C.S.T.B. in Paris was sent to the Committee members this year. This is a very interesting method with unique features not present in the methods commonly used here and in Britain.

A meeting of the Committee was held in Poland on May 24th and 25th. Several reports were presented by the experts present and considerable progress seems to have been made toward their goal of a C.I.E. Method for calculating illumination. Copies of the reports given at the meeting as well as details of the meeting itself have just been received and I have not had an opportunity yet to study them in detail.

M. G. Currie,
Corresponding Member.

C.I.E. COMMITTEE E-4.1.1 EDUCATION IN SCHOOLS
1964-1965

There has been very little activity in this Committee during the past year. An exhibition by the C.I.E. Education Committee at the meeting of the International Union of Architects in Paris in July, 1965, was planned but I have not heard if it actually took place.

M. G. Currie,
Expert Member.

MGC:er

October 20, 1965.

CANADIAN BROADCASTING CORPORATION

# THE CANADIAN NATIONAL COMMITTEE OF C.I.E.

Report to Annual Meeting, October 29, 1965
Ottawa, Canada.

D. W. FRICK
Expert Committee E3.1.9.2.

One meeting of the Committee was held in Prague, April 15, and 15, 1965. This was attended by twelve committee members and six observers. No one from North American was able to attend.

Subjects discussed at this meeting covered:

1. Symbols and terminology for stage and studio use.
2. Progress on choice of dimming curves. The U.K. seems to prefer "square" law relationship for stage, "cube" law for studio.
   The German sub-committee prefers a linear relationship for film and television.
   U.S. and Canada seem to want "square" law for stage and "linear" for studio (TV).
3. Bibliography:- discussion on exchange of reports, papers and magazines between countries.
4. Code of Practice:- on the preparation of practices to guide newcomers to the field of stage and studio lighting.
   The European Broadcast Union has prepared an excellent book on lighting in television studios.
5. Colour Temperature for Colour TV Studio Lamps:- discussion covered life of lamps operated at 3200°K, effects of dimming, it was noted by U.K. that individual dimmers improved lamp life. In U.S. Television some lamps are specified and operated at 3000° ± 150°K. U.S.S.R. film studios use 3300°K but are changing to 3300°K. Quartz halogen lamps are becoming more widely used and appear to be satisfactory for 3200°K application, but tend to show violet or blue at reduced voltage.

Reports were also received from the German sub-committee.

A "Symposium" on television lighting was held at CBS studios in New York City lasting three days in June this year. Four papers were contributed from Canada. It is proposed to hold a second in Chicago of next year. The papers will be published in Illuminating Engineering.

D.W. Frick

D. W. Frick, Eng.,
Member C.N.C. of C.I.E.,
E3.1.9.2 Stage and Studio
Lighting.

C.I.E. COMMITTEE E.3.1.9.2.

Easter 1965, meeting in Prague.

A. Programme

1. The formal meetings were attended by:-

K.R. Ackerman, Chairman
A. Adàr
G.I. Ashkenazy
N.V. Gorbatchev
G. Leblanc
A. Stuyckens
J. Pechar
M. Kouril
A. Vancura
F. Bentham
S.L. Johnson
P.R. Berkeley, Secretary
J. Praus - (Observer)
M. Bazant (part time)
M. Illner (interpreter)
J. Moravek (interpreter)
X. Soukupova (interpreter)
J.T. Wood (interpreter)

2. AGENDA: for Formal Meetings

1. Terminology and symbols
2. Dimmer Law Report
3. Bibliography
4. Debate on "Code of Practice" project.
5. Colour Temperature of colour TV Studio lamps.
6. Future Programme of Work.
7. Any other business.

3. 15th April Lunch.

The delegates were entertained to lunch by the Czechoslovak National Committee of the C.I.E., when they met Mr M. Jahoda, Director of the Research Institute for Picture & Sound (Vuzort)

Mr F. Kolmer, Vice Director of Vuzort & Chief of the Acoustics Department.

contd.....

Mr J. Svehla, Chairman of the National Committee &Chief of Lighting Research at Tesla Holesovice.

Mr J. Krtil, Secretary of the National Committee & Chief of the Photometric Laboratory at Tesla Holesovice.

4. 16th April reception

A delegation of members of the Conference was received by the Vice Minister of Culture, Prof. Dr. Ing. Janu who welcomed the meeting in Prague and hoped that the work of the committee would be fruitful.

5. Excursions & Visits

Our Czechoslovakian hosts organised a magnificent series of visits during our stay in Prague and these included:-

Visits to the National Theatre for a new production of "Romeo and Juliet" and a traditional production of "The Bartered Bride".

Visits to the "Laterna Magica" for a production of "Tales of Hoffman".

Visit to the "Pantomime on the Balustrades" in a small Youth Theatre.

Visits to the Television Studios.

Visits to the Scenographic Institute.

Visit to the Barrandor Film Studios.

In addition excursions were arranged in the surrounding countryside in particular to the Castle of Karlstein. The old town of Prague to the Castle were explored by all those who managed to spend an extra day after the meetings, the stained glass of St. Vitus Cathedral being a memorable sight.

contd.....

B. Formal Business

1. Symbols & Terminology

Proposals for additions to or variations of the "basic" symbols circulated by the U.K. Committee had been received from many countries, and these were all displayed on a single drawing distributed to members at the meeting. In addition letters had been sent by several members supporting the "basic" proposals.

After considerable detailed discussion it was agreed that the basic symbols should be somewhat modified and that the "Source" proposals of the USSR members should be adopted with minor modifications. Where necessary local additions might be adopted to indicate attachments, circuit references, wattage ratings etc but it was not proposed to standardise on these additional symbols at the present time. A drawing of the agreed symbols is appended.

It is important that these symbols be used for internationally distributed publications and members are asked to give them the necessary publicity. The C.I.E. "Definitions and Vocabulary Committee" E.l.l. will be informed of these decisions. Consideration will be given to producing plastic templates which will enable the outlines to be quickly added to lighting plans.

While translations had been received of the "terms", only the English version of "Definitions" was yet available, and Messrs. Leblanc, Summerer and Ashkenazy were asked to prepare translations into their languages.

2. Dimmer Law Report

Mr Bentham reported an experiment in which a variety of dimmer laws were available from identical controls and these were used by a number of Television Lighting Directors (Supervisors) using an Image Orthicon camera in a simple set with a model. They checked their prefferences by observation of a properly set up picture monitor only. The controls were labelled A → F, one law being duplicated. (A copy of this report is included for those Expert Members who were unable to attend).

contd.....

The results showed a marked preference for a "square law" dimmer curve (i.e. one in which the light output is proportional to the square ~~root~~ of the scale reading, 100% being indicated by 10 on the dimmer scale). The "linear light" law was least popular -(i.e. where the light output is directly proportional to the scale reading).

It is proposed to repeat the experiment with a number of experienced theatre lighting operators on a small stage. It is anticipated that the "square law" may be too coarse at the low-brightness end of the scale for theatre work, where it is important that circuits can be brought in from blackout very smoothly. A "cube law" curve might be expected to provide such control.

It appears that the Belgian I.N.R. have adopted a curve which is between "linear" and "square law" for their TV Studios.

The USA favoured a "square law" but Mr Frick of Canada reported experimental evidence in support of a "linear law" for TV Studios. It was not proposed that formal agreement be reached at this point as further work was planned, and all members were asked to investigate and report to the Secretariat any evidence on this subject.

3. Bibliography

The UK members distributed lists of recent articles and publications dealing with theatre, film and TV lighting and displayed typical examples of such literature. There were further contributions from the USSR, French and Belgian members and by post from Australia.

Mr Bentham suggested that to assist the exchange of such information in future a short precis should be included as well as a classification of the scope of the literature - such as "short summary" or "general review" etc.

All members are asked to send such lists to the Secretary for general distribution, if possible each year. Mr Ashkenazy suggested that members from different countries might be willing to exchange such publications, to avoid the problems of arranging overseas subscriptions.

contd.....

4. Debate on "Code of Practice" Project

This item had been originally included in our programme at the request of Mr Adar with the aim of giving guidance to organisations starting a TV service. Some work had been done by the UK Committee on "lighting for a vidicon studio" and recently the European Broadcasting Union had issued a Monograph (No. 3101) on "Lighting for Television" which dealt fully with the techniques and equipment for such studios.

After discussions it was agreed that the task of this Committee was to specify the "hardware" rather than explain the technique and that therefore work should continue on this project, keeping the EBU informed of progress and proposals to avoid duplication.

In order to give as wide a validity as possible to such data, it was proposed that a Questionnaire be circulated by the U.K. from which a better knowledge of present equipment usage could be obtained.

5. Colour Temperature of Colour TV Studio Lamps.

Mr Johnson reported that although we had agreed at the Vienna meeting in 1963 that "the colour temperature of lamps used in colour TV studios should be 3200°K ± 100°K, there have been many suggestions that the life of lower wattage lamps is reduced to unecomonic levels at this temperature. While Tungsten-Iodine (Quartz-iodine or quartz-halogen) lamps appear to offer increase lives at these temperatures, their spectral distribution is not that of a "black body" and may show violet or blue at reduced voltage.

The U.S.A. view communicated by Mr Ahern indicates that 3000°K ± 150°K is commonly used without apparent ill effects on the picture. The B.B.C. find that with one dimmer per lamp the problem of the short life of 3200°K lamps not serious nor when Tungsten-iodine lamps are mixed with normal tungsten.

Mr Gorbatchev reported that in the USSR Film Studios had standardised on 3300°K, but were moving to 3200°K as being more practical to maintain. They had tried Tungsten-iodine lamps but, like others, not in sufficient quantity to be able to form a positive opinion.

contd.....

Mr Ackerman stated that a drop from 3200°K to 3000°K would result in about 60% reduction in light output, which was probably adequate for TV picture matching. Mr Leblanc reported that in ORTF experience lamps can drop from 3200°K to 2800°K during the 20 hours of operation involved in a show.

It was agreed that our proposals should be modified to "3200°K for lamps above 1Kw". All members are asked to report any further developments in this field.

6. Programme of Work

a) Glossary.

Symbols - agreed, see 1 above.

Definitions - to be translated from English.

A proposal from the USA to include terms such as "high key" - "low key" etc. should not be proceeded with at present (The EBU Monograph 3101 is available in French and English and gives several similar terms).

b) Colour Temperature - see 5 above

c) Code of Practice - see 4 above

d) Dimmer Laws. - see 2 above

e) Photometry - Little progress has been made. The general rule being for each manufacturer to use their own method of test presentation. There is a USA document which must be studied and Mr Stuyckens reported that some aspects are covered in a Belgian document which he promised to send to the Secretariat. The USSR members said they had "general equipment" specifications and promised to produce a draft of the proposed parameters which required definition.

contd.....

f) Dimmer Classification

Mr Leblanc suggested that it was important to include "memory" systems as well as dimmers in this classification.

g) Report for Washington, June 1967

Mr Ackerman reminded the meeting that reports should be available by September 1966 from all countries. Two reports are required, one a "Chairman Report" on the work of the Committee and the second a series of statements on the state of development over the 4 year period, Jan.63/Sept.66.

7. Additions to Programme of Work

Mr Ackerman reported that the following additions had been proposed to the P. of W.

i) Film studio lighting standards.

ii) Graphical symbols for the mounting of luminaires (e.g. floor stands etc.).

iii) Graphical symbols for dimmers.

iv) A questionnaire on film lighting.

v) Standardisation of projection lamp bases, bipost recommended (from USA). This was thought to be outside our terms of reference.

vi) Standardisation of colour temperature of colour transparency viewers at 3800°K (from USA). This will be passed to the Photographic section of I.S.O.

vii) Mr Adar asked if methods of plotting lighting rigs and cues could be agreed to simplify the international exchangeof theatrical shows. He was aware of a code produced for USA University Theatres. Mr Adar undertook to produce proposals to put before the Committee.

contd.....

C. Informal Talks

The opportunity was taken during the meeting for brief "state of the art" talks by members, illustrated by slides and films.

Mr Leblanc showed recent developments in Xenon projectors and lighting control boards in France.

Mr Johnson outlined new film and still photographic equipment, particularly portable units using over-run lamps and tungsten-iodine lamps.

Mr Ashkenazy showed recent lighting equipment produced in the USSR for theatre lighting and Mr Gorbatchev covered recent television lighting and photometric and colormetric equipment.

Mr Bentham traced recent developments in theatre lighting in the U.K. and new luminaires.

Mr Ackerman showed the latest BBC TV studio lighting equipment designed to improve studio utilization including the recently introduced "twister" which is both spotlight and flood light.

Mr Berkeley showed grid and telescope lighting suspensions and discussed the close relationship of lighting control with camera control.

Messrs Ackerman and Berkeley showed 16 mm telerecordings of recent programmes (405 lines, telecine gamma prints). The BBC recording showed a typical film plus studio production of the Series "Dr. Findlay's Casebook". The ABC recording showed how Outside Broadcast equipment was used to record on tape sequences later integrated by re-recording with the studio production.

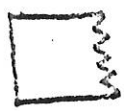
P.R. BERKELEY

28th April, 1965.

# BASIC SYMBOLS for Luminaires

C.I.E.
Ctee
E.3.1.9.2

Agreed April 1965

| | | | | |
|---|---|---|---|---|
| 1 | FLOODLIGHT | STUDIOFLUTER | RÉFLECTEUR DIFFUSANT |  |
| 2 | SPECIAL FLOODLIGHT (TV "SCOOP" ETC) | SPEZIAL FLUTER | RÉFLECTEUR DIFFUSANT SPÉCIAL |  |
| 3 | REFLECTOR SPOTLIGHT | SPIEGEL SCHEINWERFER | PROJECTEUR -RÉFLECTEUR |  |
| 3A | SEALED BEAM SPOTLIGHT | | |  |
| 4 | LENS SPOTLIGHT | LINSEN SCHEINWERFER | PROJECTEUR À LENTILLE PLAN-CONVEX |  |
| 5 | FRESNEL SPOTLIGHT | | |  |
| 6 | PROFILE SPOTLIGHT | | |  |
| 7 | EFFECTS SPOTLIGHT | | |  |
| 8 | SOFTLIGHT | | |  |

# 9. SOURCES.

| | | | |
|---|---|---|---|
| A  TUNGSTEN G.S. LAMP. | B  INCANDESCENT LAMP. WITH MIRROR REFLECTOR | C  TUNGSTEN-IODINE. (QUARTZ-IODINE) | D  MERCURY VAPOUR FLUORESCENT |
| E  GLOBE TYPE GAS DISCHARGE (SPECIFY GAS) | F  TUBULAR GAS DISCHARGE (SPECIFY GAS) | G  FLUORESCENT | H  ARC |

# 10. ATTACHMENTS ETC. (OPTIONAL USE)

| | | | |
|---|---|---|---|
| A   WATTAGE & CIRCUIT NUMBER | B  4×0·04 LAMP RATING | C  POLE OPERATION | D   IRIS |
| E  NARROW BEAM | F  TUBE ("SNOOT") | G  SPILL RINGS | H  "SNOOT" |

10 CONTINUED.

J

PROFILE ATTACHMENT

K

"BARN DOORS"

L

DIFFUSER

M

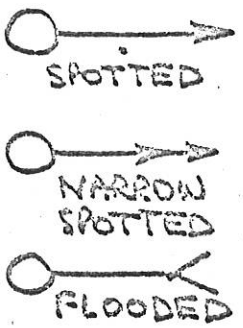
SPILL SHIELD

N

40 BLUE

COLOUR FILTER

P



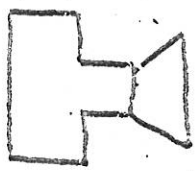

Q

ULTRA VIOLET

R

FILM/SLIDE PROJECTOR

S



PANORAMA PROJECTOR

T

CINE

U

SHADOW PROJECTOR

The Canadian National Committee of CIE, Ottawa, Canada

E - 3.3.1, Public Lighting, "Eclairage public"

"Strassenbeleuchtung"

The name of our Committee has been changed from Street Lighting to the actual name while a strong recommandation from USA wanted Roadway Lighting.

The 32 pages, letter size code with eight main paragraphs, thirteen figures, four tables and the index has not yet been published and is withheld.

There were 18 replies sent by various National Committees so the quota laid down for the approval of the document was reached. The Committee will give satisfaction wherever possible to all comments sent in. Document is now published.

In conclusion the Committee will established a united position wiht E - 3.3.5, Automobile Headlights and Signal Lights and are requesting all member of both Committees to take part in order to draw up a complete report on this subject, to be presented at the next plenary Session of the CIE.

Your representative has sent a copy of the Canadian Good Roads Association Code, which is actually considered of being adopted as a Canadian Standard Code. sent to CIE

The writer due to illness was away from his office during six months and could not follow the National an International activities as usual, so please, accept my apologies.

GAW/dl

Georges A. Watters
Members CNC of CIE

October 6, 1965.

ONTARIO
DEPARTMENT OF TRANSPORT

RESEARCH BRANCH

PARLIAMENT BLDG.
TORONTO 2

# REPORT TO CNC ON ILLUMINATION

re

## CIE COMMITTEE E-3.3.5

## AUTOMOBILE HEADLIGHTS AND SIGNAL LIGHTS

---

Things have been rather quiet for the corresponding members this year since the committee of experts undertook as its main task a rather comprehensive series of studies of the perceptibility of automobile signal lights. These studies have not progressed far primarily because of the lack of time and staff available for such work in four of the six member countries.

October 4, 1965

E. H. Brezina
Corresponding Member
CIE E-3.3.5.

CABLE ADDRESS "RESEARCH"
ADRESSE TÉLÉGRAPHIQUE

PLEASE QUOTE FILE No. .....
No DE DOSSIER À RAPPELER

NATIONAL RESEARCH COUNCIL
CONSEIL NATIONAL DE RECHERCHES
CANADA

DIVISION OF BUILDING RESEARCH
DIVISION DES RECHERCHES EN BÂTIMENT

OTTAWA 2.

October 29, 1965.

Report on Work of Committee E.3.2 Daylight

A meeting of the Committee was held in Newcastle England in April of this year. Unfortunately, I was unable to attend. The following projects are being undertaken by the Committee.

1. Guide to Daylight Calculation for overcast sky conditions. This is now being revised by Mr. Lowson, Australia and when the draft is completed it will be sent to National Committee for approval.

2. Measurement of Climatological Data needed for Daylighting problems. The work on this subject including a questionnaire addressed to meteorological stations in the member countries, has been completed. An informal report (Information No. 3, 1964) has been issued by the C.I.E.

3. Standardization of Luminance Distribution from Clear Skies It has been agreed that a standard for the distribution of light from a clear sky should be prepared. This will relate the proportion of the value of zenith luminance to the luminance at any point. Mr. Kittler, Czeckoslovakia has proposed a formula based on his observations and is proceeding to the preparation of tables derived from the formula. This will be presented to the C.I.E. so that it may be checked by measurement in other countries.

4. Colour Temperature. An attempt is being made to establish Standards for the colour temperature of sunlight, overcast sky and clear sky for daylight design purposes.

5. Light Transmission Characteristics of Glazing Committee E.2.2. Characteristics of Lighting Materials, is working on the light transmission factor of clear glass and is expected to make recommendations regarding the method of taking into account transmission factors in Daylighting calculations. The light transmission qualities of 1000 samples of glass and plastic are being measured in France.

6. Permanent, Supplementary Artificial Lighting. This subject is being considered by a special subcommittee of E.3.2. A meeting was held in Paris at which there were 30 delegates. The programme is in the care of Dr. Hopkinson, Great Britain.

7. Sunlight. The members of Committee E.3.2 at their meeting in April recommended that this subject should be covered by a subcommittee of E.3.2 rather than by the formation of a separate committee.

M. Galbreath,
Corresponding Member,
Committee E.3.2 Daylight.

CABLE ADDRESS
ADRESSE TÉLÉGRAPHIQUE "RESEARCH"

PLEASE QUOTE FILE No. .....
No DE DOSSIER À RAPPELER

NATIONAL RESEARCH COUNCIL
CONSEIL NATIONAL DE RECHERCHES
CANADA

DIVISION OF BUILDING RESEARCH
DIVISION DES RECHERCHES EN BÂTIMENT

OTTAWA 2.

# Report on Work of Committee S.4.2
# Lighting Legislation

There has been no activity in this committee throughout the year except for a request for information on lighting regulations in Canada. A reply was prepared and sent to Mr. Schaffer, Israel.

M. Galbreath,
Corresponding Member,
Committee S.4.2. Lighting Legislation.