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Date 9 APRIL 1990

Urgent/~~Ordinary~~ (delete as appropriate)

To ATELIERS DE GOURGOUBES

Attn M. HUMBERT CAMERLO

Fax No 0103367733065

CC

From ANDREW SEDGWICK

Subject COLLECTEUR LUNAIRE

Cost –

Job no 5247/01

Recoverable ~~Yes~~/No

Total Pages 4
(including this page)

Transmission time

Message

DEAR HUMBERT,

PLEASE FIND ATTACHED SOME STUDIES WE HAVE MADE RECENTLY :

"TRANSPORTATION OF MOONLIGHT" –

i) FIBRE OPTICS : CONCLUSIONS – EXPENSIVE !
– TOO MUCH LIGHT LOSS

ii) LIGHT PIPES : CONCLUSIONS – MORE HOPEFUL
– MORE STUDY NEEDED

"COLOUR OF MOONLIGHT" –

GRAPH COMPARING MOONLIGHT WITH THREE DIFFERENT TYPES OF DAYLIGHT.

PLEASE LET ME KNOW IF WE CAN PROVIDE ANY MORE INFORMATION.

BEST REGARDS, Andrew Sedgwick.

If you have not received all the pages listed please phone us on the above number

Theatre of the Full Moon

Transportation of light from "lunar fields" to the stage

1. Fibre Optics

The most frequent use of fibre optics is for data communications, using e.m. radiation with infra-red wavelengths. Two companies in the UK produce fibres capable of transmitting visible light; TBL Fibre Optics Ltd (Leeds) and Eurotec Optical Fibres Ltd (Doncaster).

Mr David Wilkin of TBL provided the following technical information about their fibres:

1. Constructed from glass with two discrete refractive indices/densities. Light travels along fibre due to total internal reflection at the boundary between the two glass densities.

2. Fibres are 50 micrometres in diameter.

3. Light must enter the fibre within a range of 70°.

4. Light decays at a rate of 150dB/Km.

5. Light in the blue end of the spectrum decays more quickly. Hence, after a long distance the light will appear yellow.

6. A recommended maximum distance for transporting light is 20 metres. This corresponds to a 50% loss of input light. 90% of the light will be lost after 67 metres.

7. Fibre optics do not transmit U.V light well, and hence could be used in museums for the lighting of sensitive exhibits.

8. Cost. For a bundle of optical fibres 6mm in diameter, the cost would be £55/metre.

Luminaire

2. **Light Pipes** Luminaire

A thin film of Scotch Optical Lighting Film (S.O.L.F.) can be used to form a circular pipe which carries light by total internal reflection. S.O.L.F. is produced by 3M in Bracknell.

Mr W Shouler sent some samples and technical information:

1. The film is a clear 0.02 inch thick plastic film. It is manufactured using a micro replication process to provide very precise prisms on one side and a smooth surface on the other.

2. The film acts as a window or a mirror depending on the angle that the light strikes the material. If light enters the pipe within a 57.2° range it is reflected along the pipe. When light exceeds this angle it is transmitted through the film.

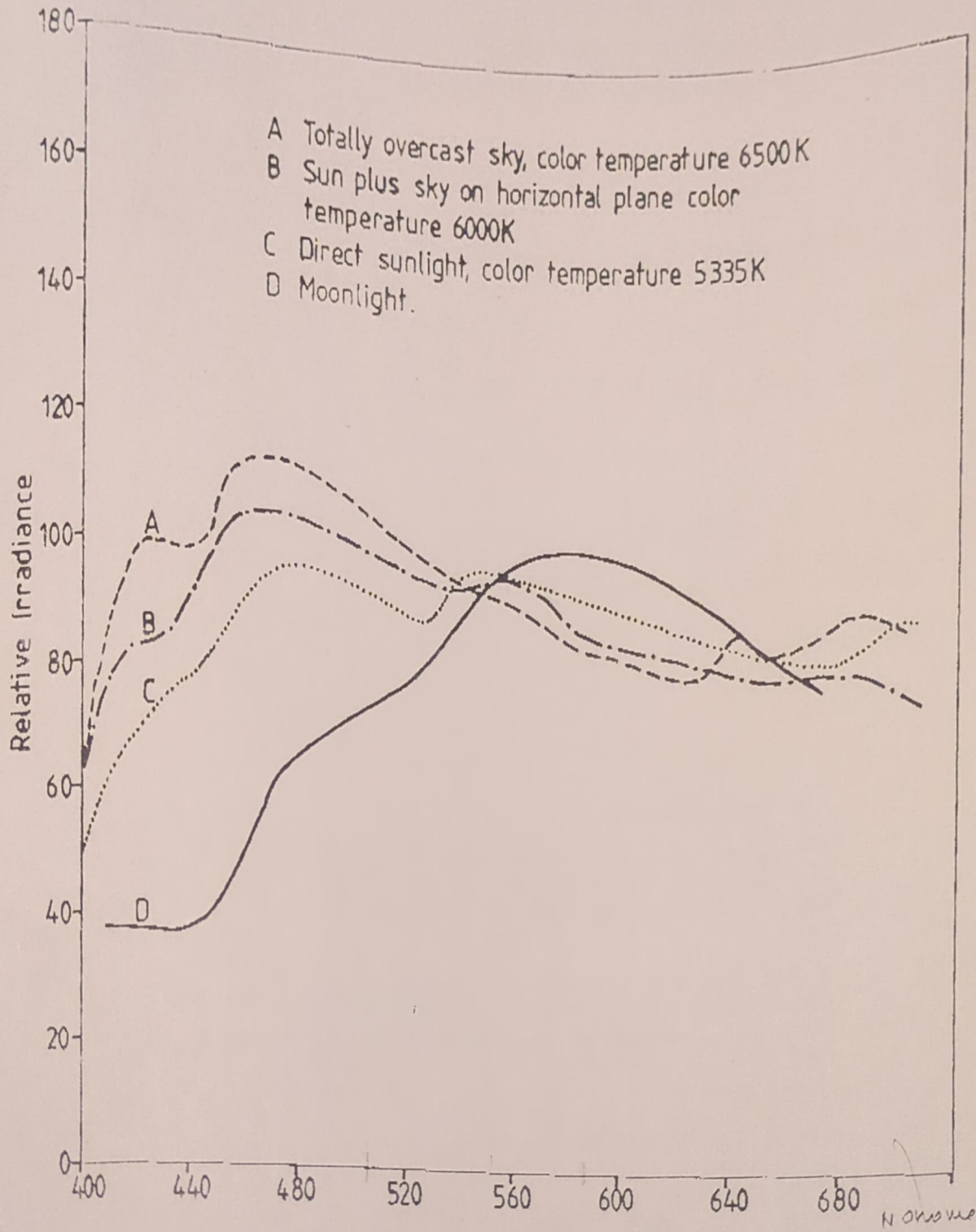
3. The decay of light along a circular S.O.L.F. pipe depends on the aspect ratio of the pipe; the aspect ratio equals the pipe length divided by the pipe diameter.

4. 50% of input light is lost when the aspect ratio is 60, e.g. a 30 metre long pipe of diameter 50cm.

5. No information is available on the spectral characteristics of light transmitted using these light pipes.

6. A "starter pack" of S.O.L.F. is available from 3M so that we can evaluate the material. 3M may let us use their laboratories to carry out tests.

7. Cost. The starter pack, which includes 10ft x 3ft of S.O.L.F., costs £175. A roll of S.O.L.F. 150ft x 3ft costs about £2,000.



Average spectral distribution curves for types of natural light on the basis of 'equal illumination'.
(After Taylor and Kerr, and Vogel)