

colour television

The
Institution of
Electrical
Engineers



The 1965
Faraday Lecture
Colour Television

by
F. C. McLean C.B.E., B.Sc., M.I.E.E.
Director of Engineering, British
Broadcasting Corporation

Deputy Lecturer: M.J.L. PULLING, C.B.E., M.A., M.I.E.E.
Deputy Director of Engineering,
British Broadcasting Corporation

Members of the Demonstration Team for the whole or
part of the time:

G.W.H. Larkby : Head of the team

J. Banks
J. Bradley
J. Cox
M. Fairhurst
J. Harris
J. Hewitson
J.P. Meadows
R. Robertson
F. Robinson
D. Simmons
M. Skeggs
K.A. Stephens
J.E. Tanner
I.H. Tear
R. Terry
P. White

Others who gave assistance:

K. Hayward
K. Howe
Miss D. Munday
F.G. Parker
Miss M.K.P. Robinson
A.R. Stanley
I. Vickers
S.N. Watson
Miss A. Westaby
T. Worswick

FARADAY LECTURE IN LONDON

Members in the London area are reminded that the London delivery of the Faraday Lecture by Mr. F. C. McLean, C.B.E., B.Sc., M.I.E.E., on 'Colour television' will take place at the Central Hall, Westminster, London SW1, on Wednesday, 17th February 1965, at 6 p.m. A synopsis of the lecture appeared in the October 1964 'IEE News', p.1.

The Faraday Lecture is intended primarily for the general public. Members are therefore asked to bring the lecture to the notice of their friends.

Admission is free by ticket obtainable from the Secretary of the IEE; a stamped addressed envelope should be enclosed with each application.

IRISH NEWS : 13.3.65

Faraday lecturer



Colour television is the subject of the Faraday lecture, arranged by the Institution of Electrical Engineers, and which is being given next Tuesday in the Mansion House, Dublin, by Mr. F. C. McLean, C.B.E., B.Sc., M.I.E.E. (above), director of Engineering of the British Broadcasting Corporation.

Among the demonstrations that will take place during the lecture will be a relay of colour television pictures, obtained from "live" cameras in the studio to be set up at the Mansion House, and also from films and slides.

Mr. McLean was born in Birmingham in 1904, and graduated from the University of Birmingham in 1925, when he joined Standard Telephones and Cables Ltd., and worked on the development of broadcasting equipment, and the construction of broadcasting stations in many European countries.

The general public lecture will be held at 8 p.m. and the Minister for Posts and Telegraphs will be guest of honour. During the afternoon, there will be a schools lecture at 4 p.m. Admission is free, but by ticket only.

SOUTH WALES EVENING POST : 25.11.64

Colour TV awaits European decision

BBC MAN'S LECTURE

DIRECTOR of BBC Engineering, Mr. F. C. McLean, last night began his Faraday Lecture tour with an address on "Colour Television" to a huge audience at the Brangwyn Hall, Swansea.

During the next six months, Mr. McLean will deliver the lecture in 13 other towns throughout Britain. Primary object of the lecture is to increase the interest of the general public in electrical matters.

Mr. McLean, who has been very much concerned recently with the development of colour television, illustrated the lecture with a colour film and "live" colour pictures relayed from a studio set up in the building.

ELECTRICAL SIGNALS

In the lecture, Mr. McLean explained the basic principles of colorimetry—the science of colour and colour measurement—and, with the aid of a number of demonstrations, showed how these principles are applied to colour television systems.

He then explained and demonstrated how a scene viewed by a colour television camera is analysed into its three primary colour components and converted by the colour camera into equivalent electrical signals.

To illustrate how a colour receiver works, Mr. McLean made use of a large model of a shadow-mask tube. This demonstrated optically the manner in which electrical signals are converted into the colour picture appearing on the face of the tube.

A POSSIBILITY

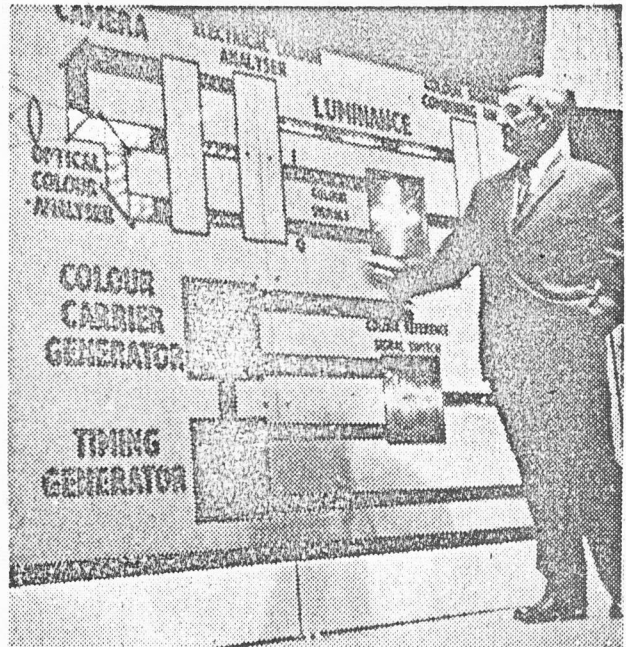
During his address, Mr. McLean said that when colour television was first demonstrated 15 years ago, a colour television service was then very remote. But, he added, it had now become a practical possibility.

He said that three colour systems were now under active consideration in Europe, and it was hoped to reach a decision on the best one at a meeting next year in Vienna. It was then hoped that an announcement would be made by the Postmaster General on arrangements for a colour television service for Britain.

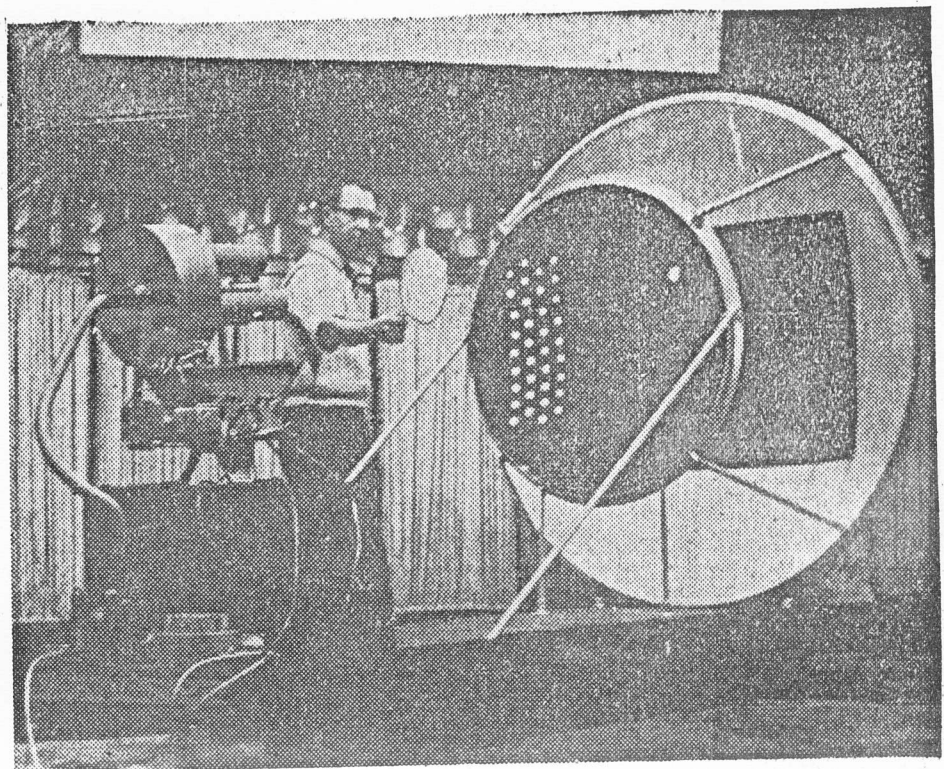
Mayor of Swansea, Councillor Willis Pile, proposed a vote of thanks to the speaker.

The Faraday Lecture series arranged by the Institution of

Electrical Engineers, is intended to spotlight various aspects of modern electrical engineering in straightforward language for the general public, and special performances for students are being arranged in many of the towns on tour. Today, senior Swansea schoolchildren had an opportunity to hear Mr. McLean.



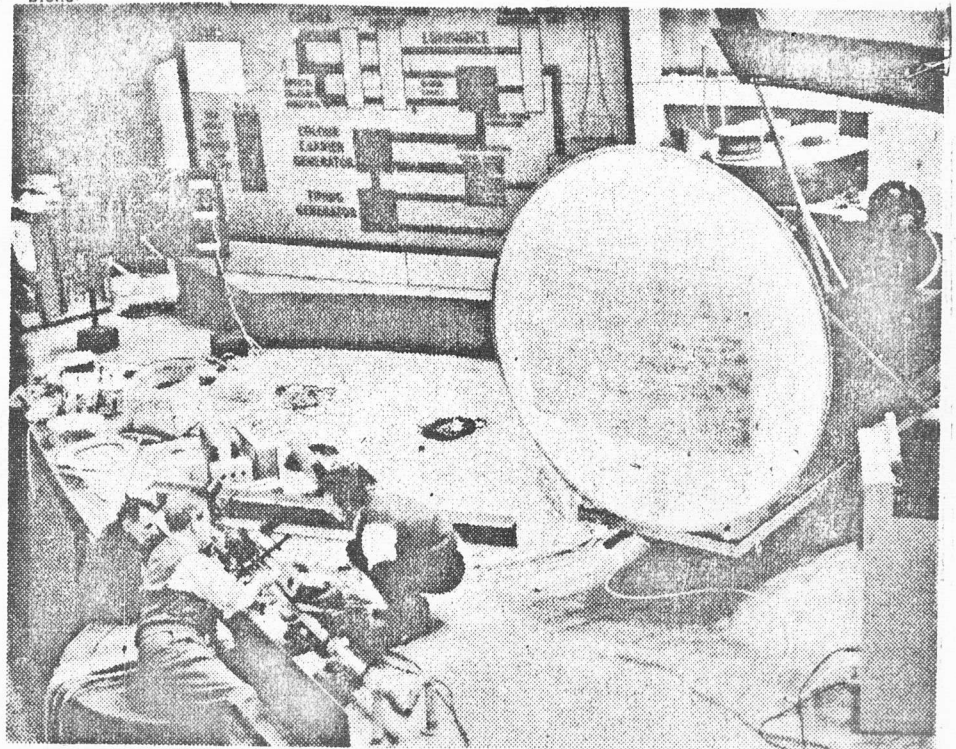
DURING his Faraday Lecture at the Brangwyn Hall, Swansea, last night, Mr. F. C. McLean, director of engineering of the BBC, made use of a large illuminated board to explain the basic principles of colorimetry—the science of colour and colour measurement.



60, 665043 and 250, Church Road, St. George. Tel. 67760. [23/fw]283
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BISHOPSTON.



A huge model of a colour television tube takes the stage as mechanics prepare for tonight's Faraday lecture at the Colston Hall.

BRISTOL: EVENING POST. Thursday, November 26th 1964

Why the West lags behind—by B.B.C. man

Bristol television viewers will not be able to receive B.B.C.2 programmes for at least 2½ years, Mr. F. C. McLean, B.B.C.'s Director of Engineering, announced this afternoon.

And if colour television is on the air by the beginning of 1967, the West Country will get it later than most other places.

The big stumbling block, said Mr. McLean, speaking at a press conference in Bristol, was the siting of the £500,000 B.B.C. 2 transmitter.

"Bristol was high on the

priority list when we started looking for a site in February last year," said Mr. McLean.

DIFFICULTIES

"But we have run into so many difficulties over siting the transmitter that Bristol has now slipped back."

The B.B.C. want to site their 1,000ft. mast at East Harptree

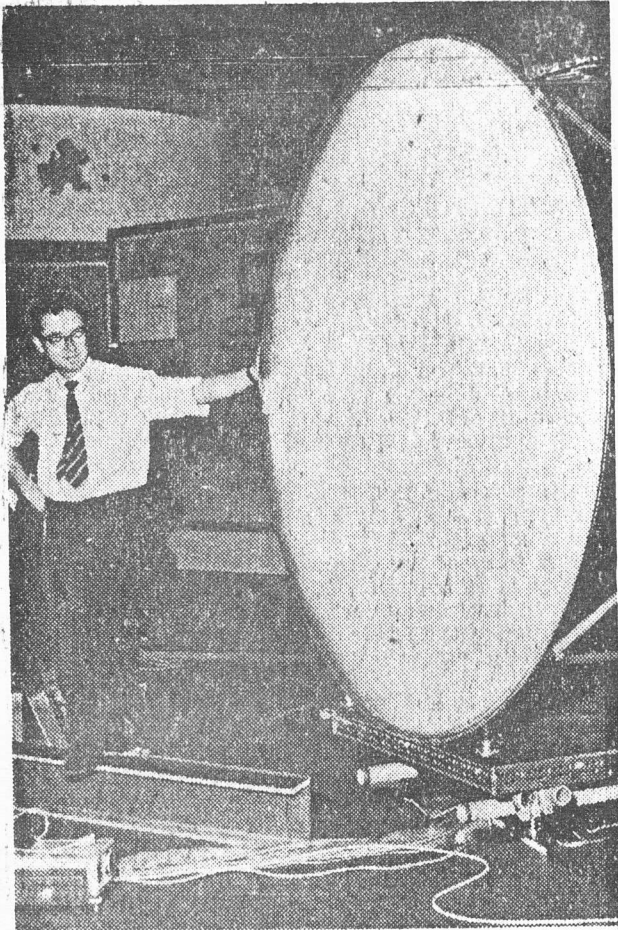
but Bristol Airport Committee object to this and have asked Somerset planners to revoke their earlier decision when they gave outline planning permission for the scheme.

"The planners meet soon to discuss the matter," said Mr. McLean. "If they do not revoke their decision we shall go ahead."

"If they do, then we shall have to look for another site and things will be held up again."

26th / 27th November 1964

WESTERN DAILY PRESS : 27.11.64



A model colour TV tube is prepared by mechanic Mr. Ralph Robertson for last night's Faraday lecture

Mast-site row hits colour TV

Western Daily Press Reporter

The row over the Mendip television mast may set Bristol a year behind other regional centres in the bid for colour television, Mr. F. C. McLean BBC Director of Engineering, said yesterday.

Mr. McLean, in Bristol to give the 1964 Faraday Lecture on colour television, told the Western Daily Press:

"Bristol and the surrounding area was very high on the list two years ago.

"But the tremendous difficulty we have had in finding a site for a new transmitting mast has held us up considerably.

"We surveyed 13 sites before settling on the one at East Harptree, but we are having objections to even that one now."

Adapted

Outline planning permission was given by Somerset county council, and approval gained from the Postmaster General and the Air Ministry.

But after objections from Bristol Airport committee, the matter will be reconsidered by the Somerset Planning committee next week.

Colour would only be relayed on BBC 2, said Mr. McLean, because other channels were unsuitable.

But colour-adapted sets would receive both black and-white and colour so viewers could still have a choice.

A colour set would cost about £200.

Geared

If agreement is reached at an international conference in Vienna next March, and the Postmaster General Mr. Anthony Wedgwood Benn approves, London and 16 regional centres could be geared to colour transmission by 1967.

During the lecture at the Colston Hall, Mr. McLean demonstrated colour transmissions, including closed-circuit transmission on scenes in the hall itself.

YORKSHIRE POST: 25.11.64

I.E.E. NEWS: February 1965

COLOUR TV LESSON IN 1849 LETTER

DECISION IN 1965

A LETTER written in 1849 was used last night at Swansea to demonstrate how colour TV transmissions are made. Mr. F. C. McLean, Director of BBC Engineering, was giving the 36th Faraday Lecture, arranged by the Institution of Electrical Engineers.

Mr. McLean explained that colour TV had been restricted to the 625 system used on BBC 2 so that existing receivers would receive the colour pictures in black-and-white, and colour receivers would also be able to take programmes transmitted in black-and-white.

Next year, the International European Committee will meet in Vienna to decide which of the three colour systems, the American NISC, the French Secam or the German Pal, will be adopted by all the countries concerned.

STARTING DATE

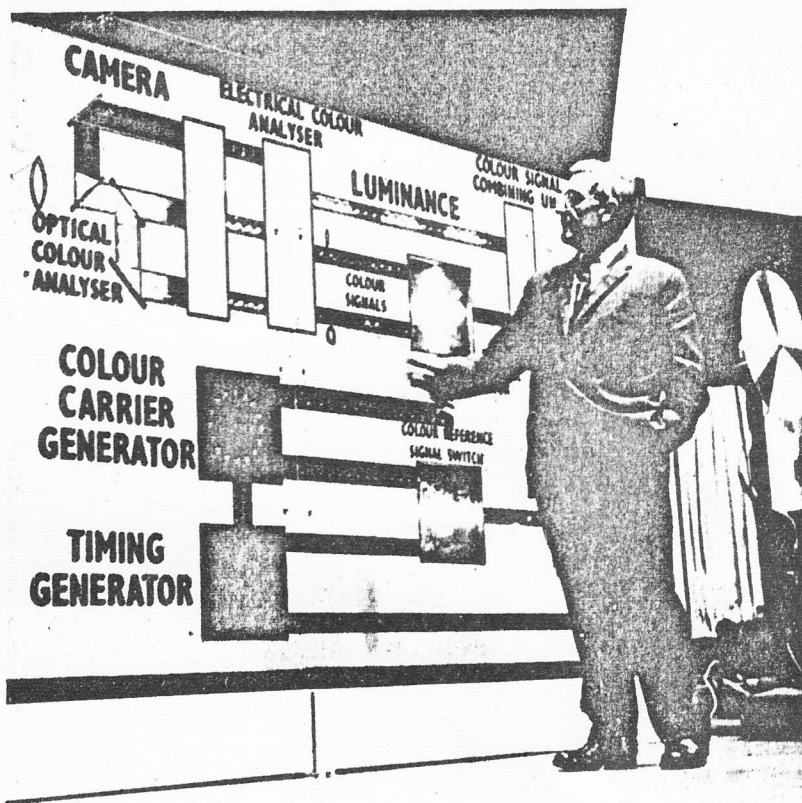
"It is hoped that the Postmaster General may be able to announce, after this decision has been made, a date for the start of a colour service in Britain," said Mr. McLean. "All the transmitter and programme distribution systems for BBC 2 have been made suitable for colour."

To explain how two separate signals were sorted out by the TV receiver, Mr. McLean showed a letter written in 1849. Because of the restrictions on letter size by the Post Office at that time, people wrote in lines at right-angles to each other on the letter.

While reading the horizontal lines, the human eye discounts the vertical lines, and by turning the page, the formerly vertical lines could be read horizontally with the eye discounting the now-vertical lines already read.

The lecture, which is free to the public, will be repeated during the next few months in Bristol, Birmingham, Leicester, Manchester, Stoke on Trent, Portsmouth, London, Bradford, Sheffield, Dublin, Belfast, Edinburgh and Newcastle.

NURSES APPEAR IN FARADAY LECTURE



Mr. McLean explains how a colour receiver works using a large model of a shadow-mask tube illuminated board.

The 1964-65 Faraday Lecture on 'Colour television' was delivered by Mr. F. C. McLean in the famous Brangwyn Hall, Swansea, on the 24th and 25th November. The evening lecture was attended by 1200 people and the morning lecture on the second day by 1000 secondary-school children, many of whom had travelled over 50 miles from different parts of the principality. Both meetings were a good send-off for Mr. McLean, who is giving the lecture in 13 other towns in Great Britain.

The array of fascinating equipment and flashing lights,

working models with films and coloured-television monitors provided wonderful illustrations for the lecture. And two beautiful nurses from a local hospital who appeared on the coloured screen were not far away, for they were in the studio on the stage, making the show very much a live one.

Mr. Duncan Cameron, chairman of the Sub-Centre, had introduced Mr. McLean, and a vote of thanks to him and his team was moved by the Mayor of Swansea, Councillor Willis Pile, and carried with acclamation.

BIRMINGHAM MAIL : 19. 1.65

COLOUR TV: A MOVE SOON AFTER MARCH?

Evening Mail Reporter

TWO hopes about the future of colour TV were expressed by Mr. F. C. McLean, the B.B.C.'s Director of Engineering, in Birmingham today.

The first was that an international conference in Vienna in March would decide on a system from a choice of three—American, French and German.

The second was that the Postmaster General would then be able to announce a date for the start of colour television.

Mr. McLean was giving the Faraday Lecture—one of three talks he is to give today—organised by the South Midland Centre of the Institution of Electrical Engineers.

He described the differences between the three systems of colour TV as comparatively small.

It had been found possible to use colour on the same channels used for black and white pictures, but it would not be possible to add colour facilities to a receiver equipped at present for black and white.

BIRMINGHAM POST: 20. 1.65

BRINGING COLOUR TV NEARER

Colour TV programmes may come one step nearer after a conference which will meet in Vienna this year to decide which of the three available systems should be adopted as standard throughout Europe, Mr. F. C. McLean, the B.B.C.'s Director of Engineering, said in Birmingham Town Hall yesterday.

The systems, one American, one German and one French, each had advantages, but if Europe adopted the same system, interchange of programmes would be made possible in colour just as they were now in black and white.

He thought it unlikely that all programmes would be transmitted in colour and there would be a need for sets which would receive both in colour and black and white.

He gave his lecture, held under the auspices of the Institution of Electrical Engineers, three times yesterday to enable schoolchildren and college students to attend.

I.E.E. NEWS: April 1965

Faraday Lecture at South Midland Centre

BIRMINGHAM

The Faraday Lecture, 'Colour television', given here at the Town Hall on the 19th January, drew audiences of over 1500 at each of three sessions. In the morning, special school parties attended the lecture; in the afternoon higher education students and other organisations were present. At the evening session, attended by the general public, the South Midland Centre chairman, Mr. H. M. Fricke, introduced the lecturer, Mr. F. C. McLean, who, with his assistants, provided a most interesting evening. Appreciation was expressed by Mr. J. G. Henderson.

2.30 pm and 7.30 pm: 26th January 1965

BOLTON EVENING NEWS: 27. 1.65

Winter Hill colour TV 'within 3 years'

THE BBC's first colour TV transmissions are likely to be confined to about 10 hours a week on BBC-2.

That was revealed by the Corporation's deputy director of engineering, Mr. Martin Pulling in Manchester, yesterday.

BBC-2, including the Winter Hill transmitter which is scheduled to start work this autumn, will probably have colour programmes within three years.

Black-and-white BBC - 2 sets will be able to get the programmes without the colour.

Going alone?

But when Britain gets colour and whether she gets it at all, will depend on the outcome of a conference at

Geneva in March.

Heads of the European TV services, including the all-important Eurovision network, will meet to decide on a common standard and method of colour broadcasting.

The Postmaster - General, Mr. Anthony Wedgwood Benn, has said that if the talks break down Britain may go it alone—if she can afford it.

National interests are bound to enter into the negotiations. The BBC, now in its tenth year of experiments with colour, is known to favour the American NTSC process.

But a French process, SECAM, and a German one, PAL, will also be considered.

£200 each

After the European networks have agreed on a suitable colour process the TV set makers would probably need about 18 months before they could put sets on the market, said Mr. Pulling. They are expected to cost about £200 each at first.

Earlier Mr. Pulling had delivered the Institute of Electrical Engineers' annual Faraday Lecture at the Free Trade Hall. The subject was colour TV.

Hundreds of schoolchildren from Manchester and surrounding towns, including Bolton, saw colour pictures shot in a temporary studio in the hall and screened live.

DAILY TELEGRAPH: 27. 1.65

THE TIMES: 27. 1.65

TV EXCHANGES IN COLOUR

Daily Telegraph Reporter

Colour television pictures were exchanged between London and Moscow for the first time earlier this month. Mr. M. J. L. Pulling, deputy director of engineering for the B B C, disclosed last night. He was giving the annual Faraday Lecture to Manchester students.

Earlier experiments involving exchanges between London and Prague and Warsaw had produced better quality pictures. An international meeting in Vienna in March would decide which of three available systems of production should be standardised throughout Europe, he said.

DATE EXPECTED SOON ON COLOUR TV

FROM OUR CORRESPONDENT

MANCHESTER, JAN. 26

A date for the start of colour television transmissions in Britain might be announced soon, Mr. M. J. L. Pulling, deputy director of the B.B.C. engineering division, said in Manchester today.

Addressing students at the annual Faraday Lecture, arranged by the Institution of Electrical Engineers, he said that the main technical difficulties of colour television had been overcome. At a meeting to be held in Vienna in March, representatives from European nations hoped to decide which of three systems to standardize throughout Europe. It was hoped that the Postmaster General would announce the date for the start afterwards.

Mr. Pulling added that once the decision had been taken colour television would be transmitted on the 625 system through B.B.C.-2 transmitters.

Beatles take a "back seat" at the Guildhall

It was not the Beatles who drew many hundreds of people into Portsmouth Guildhall last night, with queues in the street long before the doors opened, and 1,000 more applications for tickets being received than the 2,000-seat Guildhall could take—but colour television.

The Director of Engineering at the British Broadcasting Corporation, Mr. F. C. McLean, was delivering the Faraday Lecture sponsored by the Institution of Electrical Engineers. For this highly technical and specialized event, the free tickets—to the amazement of the organizers—were like gold dust.

The public were given first pick of the tickets, and mopped them up. Many members of the Institution of Electrical Engineers, invited to apply for their tickets after the public, were disappointed.

This, a spokesman said, was because the organizers felt that the Faraday Lecture was intended not for expert professional engineers, but for laymen.

NOT SO SIMPLE

The subject of Mr. McLean's lecture was very much a layman's subject. But Mr. McLean was not afraid to make his exposition of the intricacies of colour TV cameras and sets thoroughly scientific.

He explained in simple, though technical language, how a colour TV system had its own code, electronically decoded inside a TV receiver set, that crammed into a narrow radio waveband all the information necessary to produce good colour pictures.

Dwarfed by a monster working model of a colour TV

cathode ray tube, Mr. McLean told his audience that the screen of such a tube would carry some 900,000 dots which, like the dots used in colour printing, would provide the picture.

On the other end, a colour TV camera was like an ordinary camera with an "it's-all-done-by-mirrors" trick thrown in to take account of the colours.

A colour TV system suitable for use by the B.B.C. would have to allow ordinary TV sets to pick up colour programmes and show them in black and white, and conversely enable colour TV sets to pick up ordinary black and white programmes.

VIENNA MEETING

The new B.B.C.2 network, using 625 lines per screen, was designed with the eventual introduction of colour TV in mind, said Mr. McLean.

A conference in Vienna was now considering a European standard for colour TV systems, and this should come up with an answer acceptable to European broadcasters including those in the United Kingdom, by some time next month.

Soon after that he expected the new Postmaster General to announce a date for the B.B.C. to start putting out a colour TV service alongside the existing services.

The speaker was introduced by Rear Admiral J. L. Blackham, Admiral Superintendent at Portsmouth Dockyard, and thanked afterwards by Mr. Berkeley Smith, Director of Southern Television Programmes and himself an ex-B.B.C. producer.

EVENING NEWS, TUESDAY, FEBRUARY 9, 1965—17



Two lucky girls who became television personalities for the day were Doreen Sharp (left), of Fareham, and Christine Holland, of Purbrook. They were taking part in the Faraday lectures on colour television in Portsmouth Guildhall.—E.N.6713

Faraday Lecture in London

Record attendances at Central Hall

After numerous presentations up and down the country, this year's Faraday Lecture—on 'Colour television' by Mr. F. C. McLean, C.B.E., director of engineering at the BBC—reached the Central Hall, Westminster, on the 17th February. A record audience of about 2250 packed the hall and, of these, only about one-third were members of the IEE, showing that the main purpose of the lecture—to inform the general public about recent advances in the applications of electricity—is being well achieved. Distinguished guests included the Postmaster General, Mr. Anthony Wedgwood Benn, and the Director-General of the BBC, Sir Hugh Greene. The lecture was introduced by the IEE President, Mr. O. W. Humphreys.

In his opening remarks, Mr. McLean recalled that when, just 15 years ago, Sir Noel Ashbridge gave a Faraday Lecture on 'Television', viewers numbered less than 1 million; now, there are over 13 million sets. Then, colour

TV had been demonstrated as an 'academic exercise'; now it is a practical possibility—as the audience was very soon to see. After his lecture, Mr. McLean acknowledged help in his demonstrations from Mr. G. W. H. Larkby, who, as it happened, had also performed a similar function for Sir Noel Ashbridge.

REPEAT

Next day a repeat of the lecture was given for schools and technical colleges and some 2100 young men and women attended. This was the first time a second presentation had been given in London. At the conclusion of this session a vote of thanks to Mr. McLean was ably moved by Adrian Lambourne of Borden Grammar School, Sittingbourne, Kent.

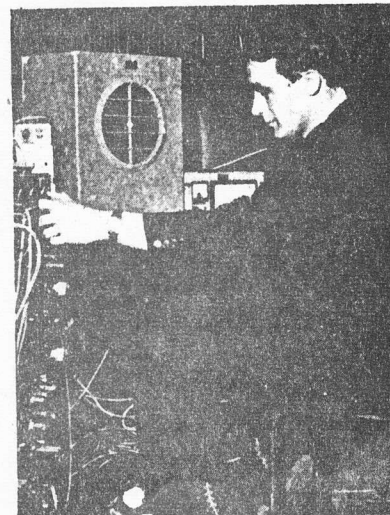
When Mr. McLean completes his odyssey—at Newcastle on the 6th April—he will have given the lecture 27 times in 14 different cities, on two occasions three times in one day.



'By our failure to see colour on black-and-white transmissions we miss quite a lot'—Mr. McLean at the rostrum.



In the depths of Central Hall a studio was improvised from which a number of short colour programmes were presented and relayed to numerous monitors in the hall. Coats of arms are (right) BBC, (left) IEE.



In another room a temporary monitoring centre was set up to control the whole presentation.

2.30 and 7.30 pm: 24th February 1965

YORKSHIRE POST : 25.2.65

COLOUR TV 'IN 21 MONTHS' B.B.C. forecast

*Yorkshire Post Television and Radio
Correspondent*

IF the BBC received Government approval in the very near future to launch colour-TV, viewers in the North of England would be able to get the service by the end of next year.

They would not have to wait until the service had been tried out in the South first because colour-programmes would be transmitted throughout the 625-line system which by then would cover about 70 per cent. of the country. All BBC-2 transmitters and booster stations will be engineered to receive colour.

The prediction was made by Mr. F. C. McLean, BBC Director of Engineering, in Bradford yesterday giving the Institution of Electrical Engineers' 1965 Faraday Lecture on "Colour Television" at St. George's Hall.

Although the BBC had said they would need two years to start up the service in fact they could, if pushed, get it into being in about 21 months. Next month an international organisation is to hold a meeting in Vienna to decide on a common colour TV system for Europe.

Comparatively soon international exchange of colour and black and white programmes would be quite commonplace. "We are anxious to get as close as possible to an international system," Mr. McLean said the cost of colour-TV sets was expected to be over £200 when they arrived on the market in this country.

Yorks. actress on colour-TV

A LEEDS amateur actress became the first woman in Yorkshire to be seen on BBC colour-TV. She is Mrs. Margaret Jowett who assisted in the presentation of the Institution of Electrical Engineers in 1965 Faraday Lecture by Mr. F. C. McLean, the BBC's Director of Engineering, at St. George's Hall, Bradford, yesterday.

A close-circuit studio was rigged up to transmit demonstration colour films on to TV sets in the hall. Mrs. Jowett appeared on the screens as a "human subject" and to introduce the items.

Mrs. Jowett, 26, lives at Linton-Av., Leeds. She is a member of St. Edmund's Players, Leeds. Previously she has taken part in a radio broadcast of the York Mystery Plays and has appeared as an extra in a Granada TV drama production.

NORTHERN DESPATCH (Darlington)
24.2.65

FINANCIAL TIMES: 25.2.65

U.K. COLOUR TV POSSIBLE BY 1967

If a decision was taken quickly to start colour television in Britain, it could be achieved by 1967, Mr. Francis McLean, the BBC's Director of Engineering, said in Bradford yesterday.

Mr. McLean, who was in the city to deliver the Institution of Electrical Engineers' Faraday Lecture on colour television, said the colour service would be put out on 625 lines on BBC-2. By 1967, 70 per cent. of Britain would be getting the 625-line service.

He thought that at first 23-inch colour TV sets would be available at a cost of £200 each.

'Colour TV by 1967 possible'

—BBC director

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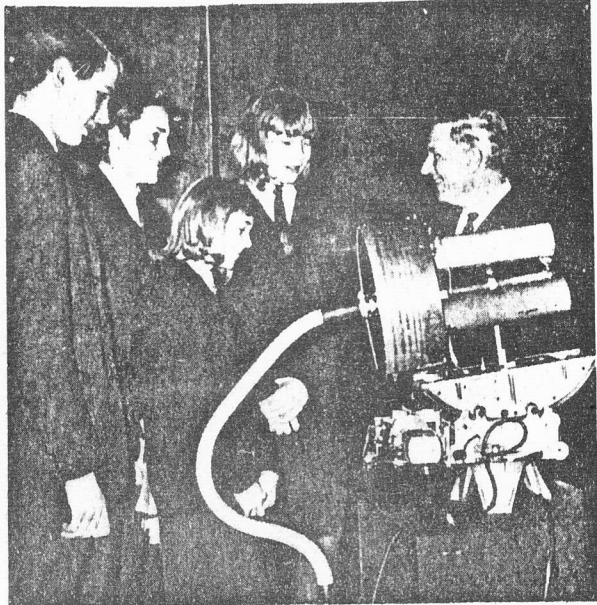
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I.E.E. NEWS : April 1965



Highlight of the lecture was the demonstration of the principles of the shadowmask tube of the colour receiver shown by means of a large working model, using light beams to simulate electron beams.



At the student lecture, Mr. McLean chats to some members of his audience. The apparatus is a most ingenious three-colour scanning light projector, part of his giant shadowmask tube model illustrated left.

EAST KENT GAZETTE: 25.2.65

BORDEN PUPILS HEAR LECTURE

Thirty pupils of Borden Grammar School attended this year's Faraday Lecture on "Colour Television" by Mr. F. C. McLean, Director of Engineering for the B.B.C., at the Central Hall, Westminster, last week.

In all, more than 2,000 boys and girls attended the lecture. The vote of thanks was given by Adrian Lambourne, a 16-year-old pupil of Borden Grammar School.

COLOUR

The Institution of Electrical Engineers — Irish Branch

FARADAY LECTURE

TELEVISION

A Lecture for the general public with films, experiments and demonstrations by **Mr. F. C. McLean, C.B.E., B.Sc., M.I.E.E.** Director of Engineering **B.B.C.** in the **MANSION HOUSE, Dublin.** on **Tuesday, 16th March 1965** at **8 p.m.** Doors open **7.30 p.m.**

The Minister for Posts and Telegraphs
Mr. Hilliard T.D. will attend.

Chairman **L.B. D'Alton M.E., M.I.E.E.**

Free Tickets for admission may be obtained from the Hon. Sec. The Institution of Electrical Engineers Irish Branch, 16 Herbert St. Dublin 2. Tel. 65191

SPECIAL SCHOOLS LECTURE at 4 p.m.

Adm. FREE by TICKET

IRISH PRESS : 17.3.65

No colour TV plans here yet

"I CANNOT foresee when we shall have an Irish colour television service, and it does not figure high on our list of broadcasting priorities at present", said Mr. Hilliard, Minister for Posts and Telegraphs in Dublin last night.

He was moving a vote of thanks to Mr. F. C. McLean, Director of Engineering of the B.B.C., who gave a public Faraday lecture on "Colour Television" to a packed audience in the Mansion House.

His lecture was under the auspices of the Irish branch of the Institution of Electrical Engineers.

Among those present were: Mr. Kevin C. McCourt, Director-General, Radio Eireann, and Mrs. McCourt, and Mr. P. G. Parker, Director of Engineering, Radio Eireann.

Mr. Hilliard continued that his Department and Radio Eireann were taking all possible steps to inform themselves on the subject of colour TV and to be ready for its introduction when the time was ripe. For instance, when purchasing equipment consideration is given to their suitability for the transmission of colour signals.

Even if colour television should be practical here within 5 to 10 years whatever system adopted would be of international standard. In other words, said the Minister, it must operate on the basis that viewers will be able to receive pictures in colour on colour receivers and in black and white on monochrome receivers.

Demonstration

In his lecture, Mr. McLean, with the aid of a large amount of B.B.C. television equipment explained how a scene was analysed into its three primary colours and converted into electrical signals which finally appear on TV screens in colour.

From a special studio in the Mansion House "live" demonstrations of colour were shown on sets around the hall.

For an earlier demonstration to schoolchildren there was also an overflow attendance. Mr. L. B. D'Alton, chairman of the Irish Branch, Institution of Electrical Engineers, was in the chair.

IRISH INDEPENDENT : 17. 3.65

No plans for Irish colour TV service

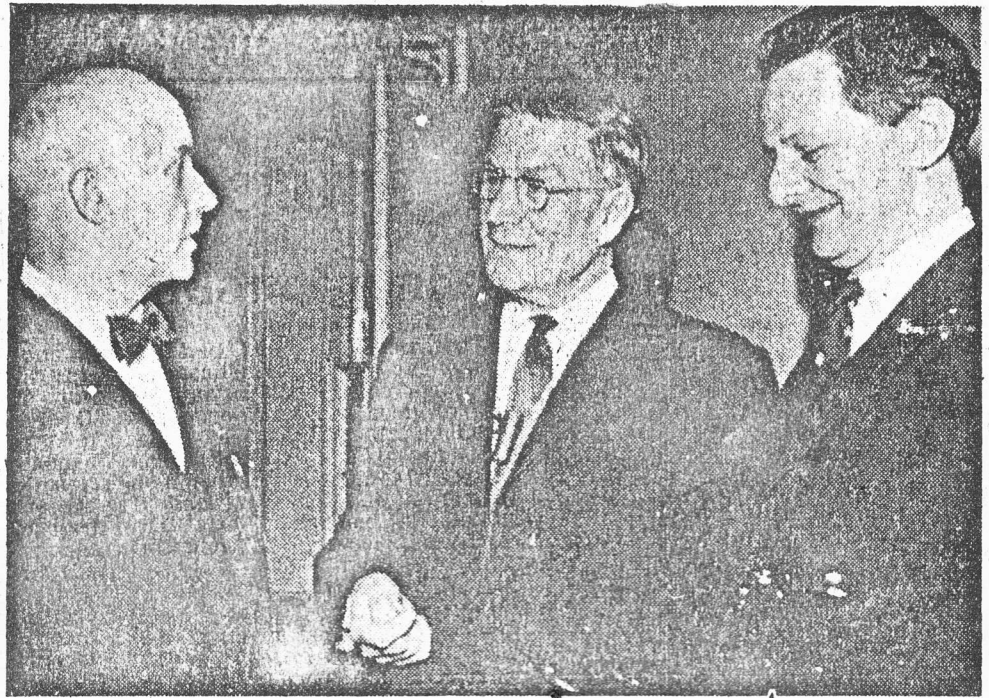
THERE are no plans for an Irish television colour service and he could not foresee

when it could come about, said the Minister for Posts and Telegraphs, Mr. Hilliard, proposing a vote of thanks to Mr. Francis McLean, director of engineering, B.B.C. Mr. McLean lectured on "Colour Television" in the Dublin Mansion House last night under the auspices of the Irish branch of the Institution of Electrical Engineers. Earlier, Mr. McLean lectured at the Mansion House to more than 1,000 secondary schoolboys from Dublin and surrounding areas.

Mr. Hilliard said that such a service did not figure high on their lists of broadcasting priorities but "come it will. Mean-

time, my department and Radio Eireann are taking all possible steps to inform themselves on the subject and to be ready for its introduction when the time is ripe," he added. Television was expensive and colour would add greatly to the costs.

Mr. McLean said that, with the introduction of colour to British television in about two years' time, Irish viewers will receive colour transmissions only occasionally. Cost of sets capable of receiving colour transmissions at first would be about £200. Later they would be cheaper. At first, B.B.C. colour transmissions would be for only a few hours daily.



Colour TV lecture

Mr. Francis J. McClean (centre), director of engineering at the BBC, who gave a lecture entitled, "Coloured Television," to the Institute of Electrical Engineers, in the Ulster Hall, Belfast, is seen here with Mr. J. F. Corcoran (left), chairman, and Mr. R. L. Marrs, secretary.

Colour TV draws big attendance

The Ulster Hall was crowded, with many people standing, for the Faraday lecture on colour television last night by Mr. Francis McLean, Director of B.B.C. Engineering.

On monitor screens placed round the hall the audience saw demonstrations of colour television broadcast from a studio at the back of the building.

Some pictures were shown in black and white, then the same pictures in colour.

The lecture ended with transmissions showing the various component parts of a colour picture and the way in which these are combined to form the complete picture.

The lecture was given under the auspices of the Institute of Electrical Engineers and Queen's University.

BELFAST NEWS-LETTER:
25.2.65

Colour TV talk Belfast, March 18

If a decision was taken quickly to start colour television in the United Kingdom it could be achieved by 1967. Mr. Francis McLean, the B.B.C.'s Director of Engineering, said in Bradford yesterday.

Mr. McLean, who will deliver the Institution of Electrical Engineers' Faraday lecture on colour television in the Ulster Hall, Belfast, on March 18th, said the colour service would be put out on 625 lines on B.B.C. 2 by 1967, 70 per cent of Britain would be getting the 625-line service. Mr. McLean thought that at first, 23-inch colour T.V. sets would be available at a cost of £200 each.

COLOUR TV IN TWO YEARS GIVEN GO-AHEAD

In two years time, if the British Government gives the go-ahead soon, we will have colour television. This was revealed by Mr. Francis C. McClean, B.B.C. Director of Engineering, in Belfast, yesterday.

Mr. McLean, who was in Belfast to deliver the Faraday Lecture at Queen's University on "Colour Television," explained that it would take two years from Government approval being received before the radio and television industry and the networks could start having colour programmes on special receiving sets.

He said the previous British Government had hoped to begin colour television transmissions by the end of 1966 or beginning of 1967. By this time also the B.B.C. would be transmitting on B.B.C.2 to over 70 per cent. of the country.

Mr. McLean said that colour would be received on B.B.C.2 on 625 line receivers costing initially between £200 and £250. These sets would also transmit in Black and white. As time went on the sets might come down in price—in the United States at the moment a colour TV set cost £140.

Another factor in the delay of the introduction of colour was deciding on a system which would be internationally accepted not only on the continent but all over the world. In Vienna on April 24 an international conference would

be held at which it was hoped final decision on the system to be used would be agreed.

American System Favoured

Experiments in colour had been going on in Britain for the past 30 years and had been intensified over the past three years. Several systems had been examined and after carrying out thousands of tests on these systems he favoured the American on which all others were based.

The introduction of colour T.V.

could give Britain a great export market in components to countries which could not afford the expense of going into the field on their own. The expense was such he pointed out that the B.B.C. would be unable to introduce it without the £6 T.V. licence being approved. This would cover the cost not only of colour television but all other B.B.C. services.

Change to 625 Lines

Dealing with the change over from 405 lines to 625 lines on television Mr. McClean said that it was B.B.C. policy to transfer to the latter. The change over would be gradual and the present 405 lines would still be in use for at least 10 more years. The 625 lines would be able to receive colour television but would show it in black and white unless it was a special set.

On the subject of sound radio Mr. McClean said that local broadcasting stations would be in operation throughout the country by next year, well before the introduction of colour television.

NEWS LETTER - 19.3.65

Colour TV in 1967

The earliest possible date for the transmission of colour television in Northern Ireland would be the beginning of 1967, Mr. F. C. McLean, director of engineering of the B.B.C., said at a Press Conference in Belfast yesterday.

But he added that when the B.B.C. 2 network started a regular coloured television programme from London, it would be visible here.

It was hoped to get a common system all over Europe and perhaps all over the world, and a conference was to be held in Vienna next week.

Mr. McLean said it was expected that the sets to receive colour would at first cost between £200 and £250. It might

be possible to rent them at from 30s. to 40s. a week.

Once production got to a reasonable level the price would come down. In America sets cost about £140.

USHER HALL, EDINBURGH

1st April 1965

SCOTTISH DAILY EXPRESS : 2.4.65



Janette and May pose for the colour camera.

Janette and May 'star' on colour TV

TWO girls from Edinburgh were the stars yesterday—in Scotland's first colour television show.

Brunette Miss Janette Burton in a scarlet blouse and skirt and red-haired Mrs. May Brown in a powder-blue dress posed in front of a camera—and 50ft. away the audience applauded as they appeared on the screen in vivid colour.

Mr. Martin Pullin, Deputy Director of B.B.C. Engineering, was delivering the annual Institution of Electrical Engineers' Faraday Lecture in the Usher Hall, Edinburgh. So many people wanted to see the demonstration that an extra afternoon lecture had to be held in the hall.

Une intéressante démonstration de télévision en couleurs au grand auditorium de l'Université de Bruxelles

Ce n'est, hélas ! probablement que vers 1970 que la Belgique possédera son réseau de télévision en couleur. On le regrette d'autant plus après avoir assisté à la conférence-démonstration donnée lundi à l'Université de Bruxelles, par M. F.-C. McLean, directeur général technique de la B.B.C., sous l'égide de l'Institut des Télécommunications et d'Accoustique de l'Université de Bruxelles et de la Société des ingénieurs des télécommunications et d'électronique.

Le grand auditorium, absolument comble (ce n'est pas souvent le cas), était meublé de différents postes de télévision qui, au fur et à mesure des commentaires extrêmement compréhensifs, même pour un non-initié, s'allumaient ou s'éteignaient, alternant le noir et blanc et la couleur avec une facilité déconcertante.

Nous n'entrerons pas ici dans les détails techniques. Qu'il nous suffise de dire que le conférencier insista sur le fait que les trois systèmes actuellement en compétition : l'américain, le français et l'allemand, ne se différencient en vérité qu'au dernier stade des opérations. C'est, en effet, seulement au décodage que chaque système utilise des méthodes différentes.

A la vérité, en boutade, on pourrait dire que la télévision en couleur est quelque peu semblable à un tamis qui trie les matières — ici les couleurs — pour les juxtaposer ensuite.

M. McLean insista d'ailleurs sur l'analogie existant entre l'imprimerie en plusieurs couleurs et la télévision en couleur. Trois couleurs sont utilisées seulement, donnant toutes les gammes nécessaires.

Sur le plan de la réalisation, il faut noter que la transmission de films en couleurs nous paraît d'une fidélité exemplaire, tandis que la prise directe en studio n'a pas encore le même relief et ne donne pas toujours une sensation de plénitude de l'image.

La B.B.C. et M. McLean, qui

ont présenté cette conférence exigeant un matériel de vingt tonnes et de cent dix millions de francs, n'avaient jusqu'à présent jamais quitté la Grande-Bretagne avec tout leur matériel didactique.

Ce fut un exploit que de monter en une petite semaine, à l'Université de Bruxelles, tout un studio, speakerine comprise, et qui bénéficia de la collaboration constante de douze techniciens sous la conduite de M. Larby.

Aujourd'hui, la télévision en noir et blanc compte cent millions de récepteurs dans le monde. Il faudra, certes, encore attendre avant de voir se multiplier la télévision en couleur, mais ce qu'il importe de savoir, dès à présent, c'est que les postes en couleur permettront toujours la prise du noir et blanc car toute une partie de la technique des deux systèmes est semblable.

C'est avec un intérêt passionné que les auditeurs-spectateurs ont suivi l'exposé d'une grande simplicité — apparente — de M. McLean. On reconnaissait, dans l'assemblée, MM. Leblanc, président du conseil d'administration de l'Université ; Vauthier, vice-président ; Gillet, administrateur ; Van Den Dungen, recteur honoraire et directeur de l'Institut des Télécommunications et d'Accoustique ; Hansel, président de la SITEL ; plusieurs recteurs honoraires et de hautes autorités diplomatiques et commerciales anglaises, etc. — A.V.

"La Dernière Heure" - (Bruxelles)

28.4.1965

Bruxelles, date de la poste.

Monsieur et cher Collègue,

La Société des Ingénieurs des Télécommunications et d'Electronique (SITEL) et l'Institut des Télécommunications et d'Acoustique de l'Université Libre de Bruxelles ont l'honneur de vous inviter à une conférence donnée en langue française par

Monsieur **F.C. McLean**

C.B.E., B.Sc., M.I.E.E., Director of Engineering de la B.B.C.

sur les

FONDEMENTS DE LA TÉLÉVISION EN COULEUR

Cette conférence s'inscrit dans le cadre des « Faraday Lectures » de l'Institution of Electrical Engineers du Royaume-Uni et est organisée avec le concours de la British Broadcasting Corporation.

Elle sera accompagnée de **DÉMONSTRATIONS** ayant pour but de mettre à la portée du public non spécialisé les principes fondamentaux de la télévision en couleur.

La conférence aura lieu le **lundi 26 avril 1965 à 20 h 30 dans le grand Amphithéâtre P. E. Janson de l'Université Libre de Bruxelles, 48, avenue F. D. Roosevelt à Bruxelles 5.**

Des **cartes d'entrée gratuites** peuvent être obtenues — dans la limite des places disponibles — sur demande adressée au Secrétaire de l'Institut des Télécommunications et d'Acoustique, Monsieur le Professeur P. HONTOY (Ecole Polytechnique — 50, avenue F.D. Roosevelt — Bruxelles 5) avant le 10 avril 1965.

L'accès de la salle sera strictement réservé aux personnes munies de cartes d'entrée.

Veuillez agréer, Monsieur et cher Collègue, l'expression de nos sentiments distingués.

M. LABAY,
Secrétaire.

G. HANSEN,
Président.



L'Institut des Télécommunications et d'Acoustique de l'Université libre de Bruxelles et la S.I.T.E.L. (Société des Ingénieurs des télécommunications et d'électronique) vous prient de leur faire l'honneur d'assister à la conférence que fera en français

MONSIEUR

F. C. McLEAN, C.B.E., B.Sc., M.I.E.E.

Director of Engineering de la B.B.C.

sur le sujet

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Fondements et avenir de la T.V. en couleur

Les fondements de la télévision en couleur, tel est le thème que s'est choisi M. F.-C. McLean, Director of Engineering de la B.B.C., pour entretenir l'assemblée qui avait profité de cette aubaine pour envahir un auditoire de l'Université de Bruxelles. Elle ne dut certainement éprouver de regret, car on fut captivé, tant par les démonstrations de télévision en couleur que par l'exposé — un exemple de clarté — de cet attaché aux services techniques de la B.B.C. et représentant de la Grande-Bretagne au Congrès de Vienne. Mais nous en reparlerons en fin du présent article.

M. McLean prit comme prototype de son exposé le procédé N.T.S.C., mouture britannique, dont l'exploitation commerciale connut bien des vicissitudes dans l'immédiat après-guerre, et qui, de nos jours suscite encore pas mal de controverses. En somme, c'est essentiellement un problème de balayage — c'est-à-dire de stabilisation de l'image — qui semble à la base de tous ses remous. D'ailleurs, a précisé l'orateur, les divers procédés ne se différencient qu'à peu d'égards. Le problème de la télévision en couleur est en effet comparable à celui que connaît l'imprimerie en couleur : le tout est de superposer diverses épreuves afin d'en obtenir une ultime, satisfaisante.

La clé de voûte de la T.V. en couleur est principalement celle de la « compatibilité ». Elle est nécessaire mais ne semble nullement suffisante. Quant peut-on dire qu'un procédé est « compatible » ? Lorsqu'un récepteur usuel, en noir et blanc, permet la conversion immédiate des images en couleur. L'inverse est vrai. Seulement, pareil procédé n'existe pas encore et la production des récepteurs ne pourra devenir vraiment commerciale qu'à partir du moment où l'on pourra combiner les deux procédés en un seul dûment rentable.

Le problème concerne donc uniquement les techniciens. M. McLean nous l'a exposé : d'abord quelques notions de physique élémentaire. On sait que la couleur n'existe matériellement pas : c'est une pure illusion d'optique. Les trois couleurs fondamentales sont le noir, le gris et le blanc ; les couleurs primaires étant le rouge, le vert et le bleu qui sont des composantes du blanc. Or, l'image couleur doit être envoyée ligne par ligne, avec le plus de circonspection possible ; on ne pourrait envoyer successivement les trois couleurs fondamentales, la réception en étant par trop grossière et trop lente, l'œil humain ne s'accoutumant guère aux scintillements qui émaillent l'écran.

« GYMNASTIQUE ONDULATOIRE »

De quoi donc se compose l'image-couleur ? De divers signaux. Le signal de *luminance*, qui transporte la luminosité, est utilisé pour le noir et blanc où elle suffisait. En télévision en couleur, il y faut adjoindre encore une seconde onde, chromatique celle-là, c'est-à-dire transportant les trois couleurs primaires fondamentales, le rouge, le vert et le bleu. La combinaison de ces deux signaux permet de colorier l'image. Il faut savoir, en effet, que le seul signal de chrominance négligerait les nuances des grains de la peau — les seuls sensibles à l'œil humain, les couleurs étant difficilement contrôlables. On aurait donc une image à l'égalité d'une palette de coloris, sans vie, une stupide juxtaposition de taches criardes, insupportables. Il faudra donc choisir un blanc standard (la luminosité d'un ciel nordique en hiver) et les nuances des couleurs seront obtenues par simple addition des trois couleurs fondamentales. Par exemple : le jaune égale le rouge plus le vert ; la turquoise : vert plus bleu ; et le pourpre magenta : bleu plus rouge.

Entre en scène le problème du transport de nos signaux sur une même longueur d'onde. Cependant pour une plus parfaite compréhension de ce qui va suivre, il nous faut encore donner deux définitions : celle de CANAL, qui est l'espace alloué aux fréquences de la T.V. (l'espace γ est fixe et tous les signaux noirs et blancs γ sont contenus) et l'ONDE PORTEUSE qui transporte le signal d'un point à un autre. Car l'espace γ est étroit : il faudra donc veiller à ne transmettre que le moins de détails possible afin d'éviter tout encombrement de canal. D'où aussi l'excellente qualité de la modulation de fréquence qui accuse une meilleure audition en radio et une meilleure vision en occurrence, parce que moins assujétie à l'écheveau des ondes usuelles. En couleur, il importe de transmettre le moins de signaux possibles — chose à laquelle parvient aisément le procédé français SECAM grâce à un habile procédé de soustraction dont nous reparlerons plus loin — pour obtenir le canal le plus large possible. Car les procédés américain et anglais recourent à une sorte de « gymnastique ondulatoire » très précaire, moins nuancée. On a constamment la désagréable impression de feuilleter une fardée de cartes postales, aux couleurs chatoyantes, certes, mais outrageusement bigarrées.

Quant au schéma de transmission, il peut se résumer succinctement de la façon suivante : en studio, l'image est trans-

LE DERNIER - NE

A Vienne, les experts des pays membres du Comité consultatif international de Radiocommunications se trouvèrent confrontés à trois procédés de télévision en couleur. Du choix qu'ils allaient émettre dépendrait l'avenir télévisuel de l'Europe, car une âpre lutte y mettait aux prises Français et Anglo-Saxons. On sait qu'ils se séparèrent sans avoir rien décidé de positif, leurs conclusions étant à même d'amener d'importantes implications et options politiques. Les Soviétiques d'ailleurs jouaient quelque peu le rôle d'arbitre : ils ont opté pour le procédé français SECAM, sans doute pour mettre d'accent sur la nouvelle recrudescence des bonnes relations franco-russes, mais, principalement, croyons-nous, parce que le procédé SECAM suppose de plus fidèles retransmissions sur longues distances. On sait en effet que la télévision est conditionnée par le relief et les éléments atmosphériques et que ses relais doivent être établis de 50 en 50 kilomètres.

Mais revenons quelque peu aux différents procédés de mise en application de la télévision en couleur. On pourrait paraphraser : SECAM, N.T.S.C. et PAL, каксекса ?

Honneur aux précurseurs : le N.T.S.C., procédé américain, couleurs et technicolor comme dans les meilleurs westerns de notre enfance ; il est subordonné au relief du pays et très instable dans la fixation des couleurs.

Le PAL : procédé allemand, créé par Telefunken, complète et améliore le procédé américain. On a trouvé le moyen de stabiliser la couleur : on l'appelle aussi N.T.S.C.-P.A.I.

Enfin le procédé SECAM : dernier-né de la technique télévisuelle et, en tant que tel, jouit des faveurs de la masse des gens — et des Français en particulier. Le procédé français a été inventé par M. Henri de France, ingénieur, financier et doué d'un flair prodigieux. Son invention sur la base de certains principes importés d'outre-Atlantique et la mise au point définitive d'un nouveau tube cathodique est assurément le fait d'un savant éminent. Mais enfin, qu'est-ce qui différencie essentiellement le SECAM des autres procédés ? A vrai dire pas grand-chose. Les principes sont identiques. Seulement comme nous l'avons souligné plus haut, il épargne de la place sur l'onde porteuse. Au lieu de transmettre le signal de luminance et celui de chrominance (qui contient, rappelons les trois couleurs primaires), et, sur chaque ligne une couleur, le SECAM transporte chaque fois un couple de couleurs. C'est-à-dire trois fois deux couleurs. Il suffit alors de renverser le sens des couleurs au balayage suivant, pour les résorber toutes et obtenir ainsi un plus ample éventail de nuances. Le SECAM (système séquentiel de mémoire) mémorise donc chaque fois une couleur — après chaque ligne — et la prodigue tout bonnement à la ligne suivante. Au lieu d'avoir : bleu, vert et rouge, on a : bleu-vert, vert-rouge et rouge-bleu. Le simple fait de n'avoir à émettre que deux signaux simplifie forcément le travail de chrominance et sa qualité. C'est ici que réside la principale innovation de M. Henri de France.

RACONTER EN IMAGES

Posons-nous enfin la question de savoir quel est l'avenir de la télévision en couleur, dans le monde et plus particulièrement en Belgique. Si, comme l'écrit J.-F. Revel, « téléviser consiste à raconter en images, à faire voir », la télévision en couleur remplirait davantage le rôle que lui assigne le virulent chroniqueur français. Et, en effet, de cette délicieuse fiction à la réalité il n'y qu'un dérisoire fossé que maints pays, déjà, n'ont pas hésité à franchir. Hélas ! pour notre pays, on n'envisage l'exploitation commerciale de la télévision en couleur que pour 1970. Et le procédé qu'on utilisera reste encore à déterminer. Peut-être l'assemblée plénière d'Oslo, en juin 1965, se prononcera-t-elle à ce sujet. Néanmoins de gros efforts, dans le domaine de la « compatibilité » des récepteurs devront encore être tentés avant la commercialisation définitive de la couleur. Notamment, en ce qui concerne le passage automatique de noir en blanc à la couleur, sans que cela nécessite de la part du téléspectateur l'achat d'un second poste : puisque les émissions en couleur n'occuperont que quelques heures d'antenne par jour. Et puis n'y regarderait-on pas à deux fois ? La télé en couleur permettra de mieux discerner la spécificité des peaux soumises à son œil impitoyable ! On en connaît certain(e)s qui marqueraient dès lors quelque hésitation à s'exhiber avec autant de complaisance.

Roger DEVREKER

Une conférence de l'« Institution of Electrical Engineers »

Qu'est-ce que la télévision en couleurs ?

Sous les auspices de l'Institut des Télécommunications et d'Acoustique de l'Université Libre de Bruxelles et de la S.I.T.E.L. (Société des Ingénieurs des Télécommunications et d'Electronique), M. F. C. Mc Lean, Director of Engineering de la B.B.C., a donné, en français, dans le grand amphithéâtre Paul-Emile Janson de l'U.L.B., une conférence intitulée : « Fondements de la télévision en couleurs ».

M. Mc Lean fut présenté aux très nombreux auditeurs par le professeur F. Van den Dungen, qui annonça que la conférence s'inscrit dans le cadre des « Faraday Lectures », de l'« Institution of Electrical Engineers » du Royaume-Uni. C'est d'ailleurs, dit-il, la première fois qu'une « Faraday Lecture » se donne à l'étranger et c'est aussi la première fois que le conférencier traite le sujet hors de son pays.

Depuis quinze ans

La télévision que vous connaissez, dit l'orateur britannique, a commencé vers 1926 en Grande-Bretagne, puis, plus tard, en France et en Allemagne. En 1950, elle n'existait encore que dans peu de pays, mais maintenant il y a plus de cent millions de postes récepteurs dans le monde.

Depuis quinze ans, on songe à la télévision en couleurs et les problèmes soulevés par celle-ci sont d'une brûlante actualité à l'heure où l'Europe s'interroge sur les possibilités d'exploitation d'un réseau d'une telle télévision ainsi que sur le choix du procédé et des solutions rationnelles internationales à envisager. La nouveauté ne s'installera que tout doucement dans les familles. Ce n'est que vers 1970 qu'il pourra être vraiment question de son utilisation pratique.

On sait qu'il y a trois systèmes, le français S.E.C.A.M., l'américain N.T.S.C. et l'allemand P.A.L. On sait aussi qu'au récent congrès de Vienne aucune décision n'a pu intervenir quant au choix de l'un des systèmes, mais qu'elle interviendra peut-être au congrès d'Oslo, en 1966...

Aux dires du conférencier, les trois systèmes seraient très peu différents l'un de l'autre; ce qui les différencierait ne concernerait guère des questions de détail.

Le procédé de trichromie

En fait, la base est le procédé de trichromie bien connu des artisans de l'imprimerie en couleur.

Lorsqu'on examine, à la loupe, une image en couleurs d'un illustré, on constate que les tonalités sont données par un mélange de points colorés très rapprochés les uns des autres; cependant, le rapprochement est tel que si l'on regarde ladite image à l'œil nu, on ne distingue pas les points séparément, mais bien une tonalité générale qui dépend de la proportion du mélange de points des trois couleurs utilisées.

une telle minutie que les faisceaux électroniques issus de chaque canon se croisent à chaque instant dans un même trou et divergent ensuite très légèrement pour venir tomber sur l'écran sensible exactement en trois points presque juxtaposés où se trouvent trois surfaces quasi microscopiques pourvues des trois substances fluorescentes capables, lorsqu'elles sont excitées par le bombardement électronique, de fournir les trois couleurs primaires additives dont il a été question.

Le principe de la T.V. en couleurs

Dans ces conditions, si le triple faisceau restait immobile pendant un certain temps et si l'on examinait l'écran fluorescent à la loupe, on verrait uniquement trois petits points colorés juxtaposés qu'on distinguerait à peine sans le secours de la loupe; mais à l'œil nu, les trois petits points seraient vus comme un seul, donnant ensemble une tonalité unique dépendant du dosage respectif des trois couleurs, lequel est commandé par l'intensité des faisceaux cathodiques.

Si maintenant on imagine que l'appareil fonctionne pour une prise de vue animée de télévision, les trois faisceaux balayent simultanément l'écran à trous en convergeant toujours vers les trous successifs de telle sorte que l'image sur la paroi sensible est créée par un triple point balayant, par bandes, la surface totale, cela en une fraction très petite de la seconde. Pratiquement, c'est un point de coloration variable, modulée par l'appareil, qui balade l'écran et reconstitue une image colorée.

M. Mc Lean a bien insisté sur tous les compromis qu'il a fallu respecter pour arriver à créer un appareil dont la complication ne soit pas démesurée. Par exemple, il a signalé que l'œil et le cerveau procèdent à la reconstitution d'une image colorée d'une façon spéciale : si l'on s'en tient au point de vue géométrique, la reconstitution a lieu dans ses plus fins détails, tandis que si l'on ne considère que le point de vue de la couleur, le cerveau et l'œil sont extrêmement tolérants. En particulier, il a montré sur l'écran de télévision une jeune femme débobinant un fil de soie de couleur rouge et il a bien fait remarquer que la seule chose qui attire l'attention de l'observateur était l'intense couleur rouge de la bobine, tandis que le fil lui-même, vu isolément, passait pratiquement inaperçu en ce qui concerne sa coloration.

Quelles sont les choses qui importent dans la vision colorée d'un spectacle de télévision ? C'est surtout une coloration normale de la peau des mains et du visage des êtres vivants qu'on peut observer. Pour ce qui est des fleurs et des vêtements, il est permis de négliger une reproduction absolument fidèle. Le spectateur n'a heureusement pas un sens critique très poussé pour ce qui a trait à la vision des couleurs.