Television in Natural Colors Demonstrated

Application of Three-Color Separation Process Used in Photography and Printing Makes Possible Transmission and Reproduction of Brightly-Colored Daylight Scenes

By Ronald F. Tiltman *
(LONDON, ENGLAND)

THE last few months have witnessed two spectacular strides in the art of television. The first was the transmission of images, using ordinary daylight, and this has removed television from the laboratory to the open air. Any light now sufficient for an ordinary photograph to be taken is sufficient for television purposes.

This step was demonstrated by Mr. J. L. Baird in London on June 11th before representatives of the press, and subsequently before several eminent scientists, including Dr. J. A. Fleming, F.R.S., world-famous as the inventor of the thermionic valve, who described it as "a very striking advance" and "a great step forward." (See also description of American experiments, page 258, September RADIO NEWS—Editor.) Writing in a technical paper after his visit to the Baird Laboratories, Dr. Fleming referred to television as "a quite genuine and veritable scientific invention" and concluded with the words: "the writer left the laboratory with the strong conviction that it was the birthplace of new, interesting, and very important inventions."

TELEVISION IN COLOR

This demonstration was almost immediately afterwards followed by a demonstration of even more striking character. The problem of color television has at least been solved, and it was demonstrated on July 3rd for the first time to the press and to a party of scientists.

By kind permission of the British Inventor, I am allowed to publish full details of this most remarkable achievement.

At the transmitter, in place of a single exploring spiral, three spirals are used, arranged consecutively round one disc, each spiral being covered with a daylight filter. The first spiral is covered with a green filter, which allows only the green rays to pass through. The second spiral is covered with a red filter which passes only the red light. The third spiral is covered with a blue filter which allows only the blue light to pass through. (See diagram.)

As the disc revolves, the face is scanned first by the red spot of light, then by the blue spot of light, and then by the green spot of light, and the cells react to these lights, sending out first an image composed of the red parts of the picture, then an image composed only of the blue parts of the picture, then an image composed of the green parts of the picture.

At the receiving station a similar disc revolves in step with the disc at the transmitting station, and this disc has behind it, in place of the ordinary neon tube, two separate glow discharge lamps.

SUPPLYING THE COLORS

It was at the receiver that a problem immediately arose. It is obvious that the receiving disc must give a red image, a blue image and a green image, and if the source of red consists only of red, as does the ordinary neon tube, it will be impossible for the receiving apparatus to produce blues and greens. The problem was to find a lamp which would give red, blue, and green,

Arrangement of the spirals on the Baird multiple-colored television disc.

for, as it is well known, all colors which we see are made up from red, blue and green; purple for example, is only a mixture of red and blue, yellow only a mixture of green and blue. In similar fashion, any other color can be made up by combining three primaries, or two of them, in the requisite proportions.

Thus it will be seen that it was essential to have three primary colors, and the neon tube contains only red.

The problem was solved by using two different lamps: the neon to give red, and a lamp containing a combination of helium and mercury vapor to give the blue and the green. These lamps are brought into operation by means of commutation. The neon tube operates while the spiral holes with the red filter are in use, and the helium and mercury vapor lamp operates while the spirals of green and blue are in use. Helium, it may be known to many, gives a vivid blue distil, and mercury gives a distil in green and also in blue, so that the lamp containing the mercury vapor and the helium gives a remarkable supply of these two primary colors.

At first sight one might remark: why not put mercury and neon into one tube? This is an unsatisfactory working arrangement, the neon tending to give an undue preponderance of red at one time and not enough red at another.

SUCCESSFUL TRANSMISSION

With his system Baird has been able to give demonstrations of television in natural colors. I was present at one of the demonstrations recently, and the vivid reality of the colorings was most remarkable, and adds very greatly indeed to the effect. A bunch of flowers, blue delphiniums, was

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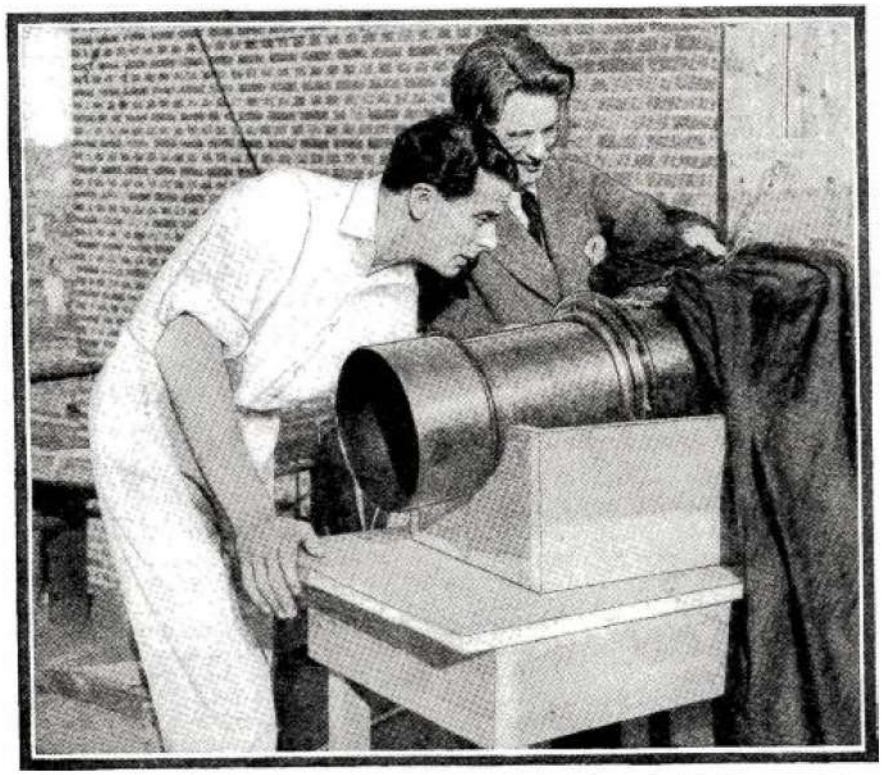

Mr. Baird (right) showing his television camera to an old schoolmate, Jack Buchanan, musical comedy star. Observe the light-gathering capacity of the lens, contained in the tube, behind which is the covered scanning mechanism.

* *Author of "Television for the Home."*

Television in Colors

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placed in front of the transmitter, and appeared on the receiving screen in a most vivid blue. This was replaced by red carnations, and the red blossoms appeared very clearly.

A human face was then transmitted, and when the tongue was put out, the pink color showed clearly, the face appearing in a different shade of pink. A policeman's helmet was then placed before the transmitter, and the blue shone up most strikingly. By far the most impressive part of the demonstration was a basket of ripe strawberries, the red fruit showing in an amazingly vivid fashion against the white basket. I also clearly saw the living moving images of a man tying a red and blue handkerchief alternately around his head.

At present there is great activity in preparing for the commencement of a broadcast television service in Great Britain. Television will be publicly demonstrated by Mr. Baird at the Radio Exhibition, to be held in London between September 22nd and 29th, and it is hoped to have the first receiving sets available at that time.

A popular type of "Televisor" will be marketed, this being a self-contained combined radio and television receiver, with a screen about nine inches square on the right and a dynamic type loud speaker mounted behind a grill on the left. It can be used as a normal radio set, and when television is being broadcast, it will merely be necessary to tune to the special station and then turn a switch to wake the television screen to life. There will probably be but two controls, and the current needed for operation of the television apparatus will be taken from a twelve-volt storage battery.

At the commencement the programs will be transmitted for one or two hours each evening and will consist of sole items such as entertainers, lecturers, cartoonists, comedians, etc.

One of the first stations to be put into operation will be 2TV, London, Baird's station, which uses a wavelength of 200 meters and a power of 4 kilowatts. Other stations will be opened in the leading provincial centres later.

Although the first programs will naturally be of a rather restricted nature, the experience in the operation of public television services in Britain and the U. S. A. must quickly lead to improvements.

FROM DOWN BELOW

Radex, our radio authority, says that he winds his own cigarettes.—*Popular Radio Weekly* (Australia.)

OUR BRITISH COUSINS HAVE 'EM, TOO

—*Wireless Constructor* (London).