

Television in Notebook VI.B.46

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This Index was first transcribed by Danis Rose in 1978¹. The very full annotations provided are still valid and can be found on the web². Our transcription brings a new editorial division of Joyce's notes, a new reading for some of them, as well as a new alphabetical tagging. To correlate our transcription to the one on the *JJDA* site, readers of this article are referred there.

The notebook entries were used in just two locations in *Finnegans Wake*. The first is a bracketed insertion on p. 123. The second on page 349 was the third 'interruption' in the 'Butt and Taff' episode. Having earlier given the hostelry a radio, Joyce then added a television. The source of most of the notes that Joyce made in notebook VI.B.46 on page 095 come from the December 25th 1937 edition of *Popular Wireless & Television Times*³ with the magazine cover cameo's boasting "All the Latest Television News". Three of the articles caught Joyce's attention: *On the Short Waves*, *Television Topics* and *Seen on the Air*.

While we were transcribing the index three sets of entries called our attention. The first was 'photo electric' that Joyce crossed out in two different colours: 'photo' in red and 'electric' in green; the second 'the scanning / spot traverses the picture,' where Joyce crossed out only the first part 'the scanning spot' (in red) and gave a funny twist to 'traverses the picture,' in 'traverses the rutilanced illustred sunksundered lines.' (*FW* 349.16); and the third 'stepped up, iconoscope, charge of light', where he deleted 'iconoscope' in green while 'stepped up' and 'charge of light' were crossed out in red. That led to a new editorial division based on the colour cross-outs that Joyce used and also to the new alphabetical tagging.

Joyce's use of the *Television* index is remarkable. In a long insertion for the second typescript of 'Butt and Taff' (II.3§4.4), Joyce brought in all the red deleted material plus some of the green crossed through jottings: *stills*, *spectre*, *fluorescence*, *ghastly*, *iconoscope* and *carrier wave*:

[In the heliotropical noughttime following a **fade** of transformed Tuff and, pending ^{^+metenergie+^} ^{^+its} **visersion**, a metenergie+^ reglow of **beaming** Batt, **the bairdboard bombardment** field of earef ^{^+tastefully+^} taut **guranium satin**, tends to **teleframe** and **step up** to a ^{^+the+^} **charge of a light** barricade. Down the **photoslope** in **syncopanc pulses**, with the bitts bugtwug their teffs, the missledhropes, ~~glitteraglatteragutt~~ ^{^+glitteraglatteraglutt+^}, borne by their **carrier** ^{^+carnier+^} **wave** ^{^+walve+^}. **Spraygun** rakes ^{^+and} **splits** them+^ ~~them~~ from a double **focus**: shellite, grenadite, alextronite, nichilite: and the **scanning spot** ^{^+firespot of the} **seanners** ^{^+sgunners+^+^} **traverses the** rutilanced illustred sunksundered lines. Shlossh! A gaspel truce leaks out over the eas **caeseine coatings**. Amid a **fluorescence** of **spectracular** mephiticism there caoculates ^{^+through the} **inconoscope** stealdily+^ a **still**, the figure of a fellowchap in the ~~woly~~ ^{^+wohly+^} **ghast**, Popey O'Donoshough ^{^+}, the jesuneral of the russuates.+^

(MS 47482-193v and MS 47480-63, *JJA* 55:106 and 107)

In the Galley Proofs of Book I, chapter 5 (I.5§1.11/4.11) Joyce used the remaining green cancelled material in an addition where contradictory terms as ‘suprasonic’, ‘millicentime’ and ‘microamp’ defined Duff-Muggli’s portrait “quoted by very kind arrangement” (FW 123.11-2):

^(his ~~electrosophonious~~ ^+**electrosophonious**+^ **photosention** under **suprasonic light control** may be **logged** for by our none too distant futures as soon as **tone values** can be turned out from Chromophilomos, Limited at a millicentime the **microamp**),+^
(MS 47476a-216, JJA 49:455)

In the addition Joyce coined a new word by bringing together the last part of the television term ‘photo-electric’ with the next entry in the notebook page ‘scophony’. Although the typist transcribed the new word as ‘dectrosophonious’, we think that what Joyce wrote was ‘electrosophonious’ (JJA 49:455) and that his badly written ‘el’ was taken by the typist as a ‘d’; a mistake that was carried over in the final version of *Finnegans Wake*. One other likely misreading in this addition is ‘astone’ that Joyce apparently wrote as ‘as tone’. Have these two mistakes escaped Joyce’s attention or did he tacitly accept them?

We have not found the source of notes (ae)-(aj) although notes (ad)-(ah) are mostly terms common in the vocabulary of television. Notes (ai) and (aj) are of special interest as not having a satisfactory connexion. They are also very badly written. The first, ‘guranium satin’ has not been explained. ‘Uranium Satin’ was a type of glass, popular in the 1930’s and used mainly for vases and ornaments. Mildly radioactive from the compounds of the element added in the glass making, today it is a collectors’ item. Many pictures can be found on the internet. One is shown below.



(Fig.1: Uranium Satin glass⁴)

Joyce may have included it in his notes because of its green fluorescent properties. He had read the article “CONCERNING FLUORESCENCE” on page 394 of the magazine we identified. Public demonstrations of television started in 1936. The pictures were small and described as ‘greenish-hued’⁵. Perhaps we can see a greenish ghostly image of the slain Russian General intruding onto the television screen of the pub as David Hayman suggests in his interesting study!⁶

But why an additional ‘g’? The best answer is provided by the first attempt to explain *Finnegans Wake*, published in 1947⁷. Campbell and Robinson ‘translate’ the text as ‘geranium satin’, a luxury material, long known, for example, in an early description of an English ball dress:

Fine net dress over a gossamer satin slip, with a rich bordering of bright geranium flowers, representing the *homestus* blossom. Corsage of fine net, faced and ornamented with geranium-coloured satin, powdered with pearls. Long sleeves of white net, elegantly finished at the wrists with geranium satin, with a foliage ornament of the same material, half way up the outside of the arm. Sultana turban of geranium and white gauze, with the Ottomane *esprit* plume in the centre, of pure gold.⁸

Sadly we can throw no light on the source of ‘tellavicious nieces’, which was Joyce’s last entry on the notebook page that we transcribed at (*aj*) below. It may be a pun on ‘television pieces’, which would tie the entry to the index Joyce was recording, or, to speculate even further, it may be a reference to some distant—hence the use of the prefix ‘tele-’ as ‘tella-’—relatives: the ‘vicious nieces’. But what Joyce really meant, we may never know. Like the previous entry it is probably not directly linked to the main index, but it is still a memorable and mysterious phrase!

The Scophony Projector was an early form of television developed in the 1930’s and the article on page 393 discussed it in detail. Its ‘Supersonic Light Control’ caught Joyce’s eye. *FW* 123.12 has it modified slightly to ‘suprasonic light control’ while *FW* 349.27 has ‘supersonic’ included in a string of words with the vowels removed: ‘smthngs gnwrng wthth sprsnswtch!’ (somethings gone wrong with the supersonic switch!). (Once again?) The typist and printers joined in too to produce the final text!⁹

References:

1. Danis Rose. *James Joyce’s The Index Manuscript: “Finnegans Wake” Holograph Workbook VI.B.46*. Colchester: AWN P, 1978, p. 204.
2. *The James Joyce Digital Archive* at: <http://jjda.ie/main/JJDA/JJDAhome.htm>.
3. *Popular Wireless & Television Times*, No. 812, Vol. XXXII, December 25th, 1937 at: <https://www.americanradiohistory.com/UK/Popular-Wireless/1937/Popular-Wireless-1937-12-25-S-OCR.pdf>.
4. Photo at: https://www.etsy.com/market/uranium_satin_glass?ref=unav_listing.
5. Nat Pendleton. *Early Electronic Television* at: https://www.earlytelevision.org/pendleton_paper.html.
6. David Hayman in *How Joyce Wrote Finnegans Wake*. Eds. Luca Crispi & Sam Slote. Madison: The UWP, 2007, p. 275.
7. Joseph Campbell & Henry Morton Robinson. *A Skeleton Key to Finnegans Wake*. London: Faber & Faber, 1947, p. 188.
8. Charles Molloy Westmacott. *The Gazette of Fashion, and Magazine of the Fine Arts and Belle Lettres*. London: Hoffman and Sams: Issue 1, Feb. 2, 1822: London Fashions. *English Ball Dress*, n. p. at: <https://babel.hathitrust.org/cgi/pt?id=nyp.33433023484656&view=1up&seq=24>.
9. Ian MacArthur: *Hell, somethings gone wrong ... ! A Wake Newslitter* New Series: XIII 1, 1976, p. 13.

POPULAR WIRELESS, ISSUED BY THE U.F.O. AS A NEWSPAPER.

REGISTERED AT THE U.F.O. AS A NEWSPAPER.

A "NIFTY" HOOK-UP FOR "TEN" By LIONEL CHESTER

Popular Wireless & TELEVISION TIMES

CUTTING OUT
THAT INTERFERENCE

PRICE 3^D

No. 812.
Vol. XXXII.
Dec. 29th, 1937.



VI.B.46.095

(a) ^xTelevision

Note: Index title. Underlined in red.

Popular Wireless, Dec.25 1937, [Television Topics] 393a: WE have had the privilege of witnessing the first demonstration of television pictures received from Alexandra Palace on a large screen by mechanical means. And when we say large, we refer to a picture nearly six feet wide.

Big - screen “mechanical” pictures have been shown before, but either they were sent by land line or employed a much lower definition than the 405-line transmission from Alexandra Palace.[...]

MS 47480-63, ScrTsIns: [^]+telavicious+[^] | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.29

(b) shortwave

Popular Wireless, Dec.25 1937, [On the Short Waves] 389a: A FEW days ago I was reading some very ancient numbers of “QST,” the A.R.R.L.’s official journal, from which so many real advances in **short-wave** technique have come in the past. Way back in 1924 I found references to the new technique of “electrical band-spreading.”

This title naturally attracted my eye, and I read on to see what this epoch-making discovery might be.[...]

The Usual Scheme

It’s rather strange to reflect that the need for band-spreading was realised as long ago as that, when the really **short waves** weren’t in use and when all listening took place above 90 metres or so. Still, I suppose it was the fact that the amateurs had to huddle together in narrow bands that led to it.

(c) ^rphoto >

MS 47480-63, ScrTsIns: the photoslope in | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.11

(d) ^gelectric

Popular Wireless, Dec.25 1937, [Light and Electrons] 399a: The “electron-multiplier,” as it is called, is a natural development of the growing importance of the **photo-electric** cell, particularly as applied to television. Like the valve, the **photo-electric** cell works with free electrons, but it can only produce them in small quantities.

MS 47476a-216, ScrPrBMA: [^]+(his ~~electrosophonious~~ [^]+electrosophonious+[^] photosensation under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+[^] | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.12

(e) ^gscophony >

MS 47476a-216, ScrPrBMA: [^]+(his ~~electrosophonious~~ [^]+electrosophonious+[^] photosensation under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+[^] | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.12

(f) ^rsplit focus, >

MS 47480-193 and MS 47480-63, ScrTsLPA and ScrTsIns: Spraygun rakes [^]+and splits them+[^] them from a double focus | *JJA* 55:106 and 107 | 1937 | II.3§4.4 | *FW* 349.14

(g) ^gsuper / sonic light control, >

MS 47476a-216, ScrPrBMA: [^]+(his ~~electrosophonious~~ [^]+electrosophonious+[^] photosensation under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+[^] | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.12-3

(h) ^rscanners >

MS 47480-193, ScrTsLPA: [^]+firespot of the ~~scanners~~ [^]+sgunners+[^]+[^] | *JJA* 55:106 | 1937 | II.3§4.4 | *FW* 349.16

(i) ^rviceversus, >
MS 47480-193, ScrTsLPA: ^+, its viceversion, a metenergic+^ | JJA 55:106 | 1937 | II.3§4.4 | FW 349.08

(j) ^rthe scanning / spot, >
MS 47480-63, ScrTsIns: the scanning spot ^+firespot of the scanners ^+sgunners+^+^ | JJA 55:107 | 1937 | II.3§4.4 | FW 349.15

(k) ^xtraverses the picture
Popular Wireless, Dec.25 1937, [Television Topics] 393a,b,c: [...] the apparatus demonstrated was of **Scophony** make, for what other system is there at the present which can offer so much? The Scophony instruments work on a mechanical principle involving the modulation of a normal light source, and rather confound the prophets of a few years ago who said that the whole future of television was bound up in the cathode-ray tube.

The Scophony System is based on a number of fundamental inventions. It is because of these inventions, some of which are absolutely revolutionary in their character, that Scophony Limited has been enabled to produce projected high-definition pictures of a size, brightness and quality so far unequalled. The two chief inventions employed are *Split Focus* and *Supersonic Light Control*.

The first of these, the “**split focus**,” is an optical arrangement of cylindrical lenses with their axes crossed, so that a beam of light is focused in two separate planes. An advantage of the split focus is that where **scanners** are employed they can be of a considerably smaller size than would be necessary with ordinary spherical lens systems. **Vice versa**, with the same size of scanner, a considerably greater amount of light can be usefully employed. For instance, without the split focus the scanner in the Scophony Home Receiver would have to be at least twelve times larger.

“**Scanning**” causes an unavoidable loss of light. The picture **is scanned in the normal way by a single spot**, whether at the transmitting or the receiving end. This spot has to **traverse the whole picture** at regular and equal intervals.

If the picture is made up of 405 lines and along each line are 500 elements, the single spot goes into the picture about two hundred thousand times.

Consequently only one two hundred thousandth part of the light which could be obtained if no scanning were employed (as in the cinema) is available. This great light deficiency had been overcome by the invention of Scophony light control.

The Scophony **supersonic light-control** consists of a container, filled with a liquid, at one end of which is a quartz crystal. When the quartz is actuated by a modulated carrier frequency, supersonic waves are set up at a speed corresponding to the velocity of the sound waves in that particular liquid.

An Ingenious Scheme

The container has on either side of it a lens, and when light is passed through the container and focused on to a scanner, and from the scanner on to a screen, an image of the light control itself is, by means of suitable lenses, formed on the screen. If the modulated carrier frequency is now applied to the quartz crystal nothing will be seen on the screen until the scanner, which is between the screen and the light control, is rotated at a speed that follows exactly the speed of the liquid.

The modulation then becomes visible on the screen as an image. In the liquid the waves produced by the element frequency on the quartz crystal are equivalent to one **scanning spot** on the screen. A large number of scanning spots are therefore used simultaneously.

In the demonstrations we saw 150 of these scanning spots were thrown on the screen simultaneously. Incidentally, only 5 to 10 watts is required to operate the Scophony light control, thus avoiding excessive power requirements and keeping the maximum voltage in the receiver down to two or three hundred.

MS 47480-63, ScrTsIns: traverses the rutilanced illustred sunksundered lines. | JJA 55:107 | 1937 | II.3§4.4 | FW 349.16

(l) ^gstills,

Popular Wireless, Dec.25 1937, [Television Topics] 393c: **Simple Operation**

The operation of the home receiver is extremely simple and there are no expensive parts requiring frequent replacement. Finally synchronisation is obtained by the use of synchronous electric motors controlled by the synchronising line frequency transmitted with the pictures from Alexandra Palace.

The only way in which a cathode-ray receiver could be said to score over the Scophony is that in the reproduction of **stills** there is a slight movement to be detected due to mechanical methods of scanning. But even this almost negligible, criticism will no doubt be overcome in later models.

MS 47480-63, ScrTsIns: ^+through the inoscope steadily+^ a still, | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.19

(m) ^r**teleframes,**

Popular Wireless, Dec.25 1937, [Television Topics] 394a: “TELEFRAMES” Items of general interest [undertitle]

MS 47480-63, ScrTsIns: tends to teleframe | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.10

(n) ^g**spectre >**

MS 47480-63, ScrTsIns: spectracular mephiticism | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.18

(o) ^g**shadow,**

Popular Wireless, Dec.25 1937, [Television Topics] 394a: **REFLECTION EFFECTS**

HAVE you ever noticed when looking at television pictures a sort of **shadow** or **ghost** outline around a sharp-edge dark object on a light background? At first thought it might appear that this was due to some maladjustment in the receiver or some light effect at the transmitter.

What is the most likely explanation is that some form of reflection or echo is occurring and the signals are being received twice by the receiver. The **ghost** effect represents the second and weaker reception of the signal.

Not located in MS/*FW*.

(p) ^r**energy beam, >**

MS 47480-63, ScrTsBMA: pending ^+^+metenergie+^ ^+, its viceversion, a metenergie+^+^ reglow of beaming Batt, | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.08-9

(q) ^g**fluorescence >**

MS 47480-63, ScrTsIns: Amid a fluorescence of spectracular mephiticism | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.18

(r) ^g**ghastly**

Popular Wireless, Dec.25 1937, [Television Topics] 394a: CONCERNING FLUORESCENCE

VERY little is known concerning the precise nature of fluorescence. The prevailing theory which seeks to explain the production of fluorescence has it that when a ray of light, a beam of terrifically high-speed electrons such as constitutes the cathode rays, or other form of energy rays, strikes a fluorescent material, the energy beam thrusts aside some of the constituent electrons of the fluorescent substance. Immediately the **energy beam** ceases, the electrons in the material take upon themselves an “as-you-were” position, that is to say, they return to their former positions within their atoms. In doing so they give out tiny quantities of energy, this energy-emission manifesting itself in the form of light-the pale, somewhat **ghostly**, yet, at times exceedingly vivid, light of **fluorescence**.

MS 47480-63, ScrTsIns: woly ^+wohly+^ ghastr, | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.20

(s) ^r**baird board,**

Popular Wireless, Dec.25 1937, [Television Topics] 394c: **TELEVISION CINEMAS**

Recent statements suggest that keen work is still going on with the possibility of television cinemas. It has been stated that a firm may start a series of 300 in the New Year.

Reproduction will be on a full-size screen, and colour films will be included in the transmissions. Recent **Baird** developments in big-screen and colour television have shown that the technical considerations are capable of solution.

Popular Wireless, Dec.25 1937, [SEEN ON THE AIR] 397a,b: **The Amount**

[...]

Politicians just now are vastly interested in the future of television as it affects the cinema. The other night I was suddenly whisked off to a disused, unheated cinema at Bromley, in Kent, there to see the B.B.C. programme picked up and projected on to a large screen by the **Baird** system. The screen measured 8 feet by 6 feet, and the method of projection was interesting. The apparatus used resembled a magic

lantern that is to say, the picture was projected from the front through a powerful magnifying lens. There the resemblance ended, for instead of the “slide” the picture was produced on the base of a small cathode-ray tube. The screen was directional, so that at acute angles the brightness was not particularly good. But, sitting in the centre of the stalls, at a distance of about thirty feet, the illumination was surprisingly effective.

I was informed that the brilliance was about a third as great as that of a small cinema screen. The most astonishing part of the demonstration was that the 405-line picture enlarged to such a size should have been so satisfactory as regards **definition**. In my opinion lack of **definition** was less important than the lack of light.[...]

I should like to say one more thing about the Baird big screen: The picture was not green, as other large pictures produced by the cathode ray principle are. It seemed to me more of a sepia than a black and white, though it had a faint yellowish-green tinge in it.

MS 47480-63, ScrTsIns: the bairdboard bombardment screen | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.09

(t) **^smicroamp**

Popular Wireless, Dec.25 1937, [Light and Electrons] 399a: **Colossal Amplification**

The filament of a valve liberates a copious stream of electrons, and there is no particular advantage in using secondary emission to produce more. But in a photo-electric cell, the initial supply of working electrons depends, not upon heat, but upon the relatively feeble impact of a ray of light, which at most is only capable of producing an output of a microamp or so. A current of this order must be amplified by passing it through a valve before it can be put to any useful purpose.

MS 47476a-216, ScrPrBMA: ^{^+(his electrosophonious ^+electrosophonious+^ photosensition under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+^ | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.15}

(u) **^rbombarded, >**

MS 47480-63, ScrTsIns: the bairdboard bombardment screen | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.09

(v) **^rcaesium coating >**

MS 47480-63, ScrTsIns: over the eas— caeseine coatings. | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.17

(w) **^rspray gun, >**

MS 47480-63, ScrTsIns: Spraygun rakes | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.13

(x) **^stone values, >**

MS 47476a-216, ScrPrBMA: ^{^+(his electrosophonious ^+electrosophonious+^ photosensition under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+^ | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.14}

(y) **^sphotosensitive, >**

MS 47476a-216, ScrPrBMA: ^{^+(his electrosophonious ^+electrosophonious+^ photosensition under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+^ | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.12}

(z) **^rstepped up, >**

MS 47480-63, ScrTsIns: and step up to the charge of a light barricade. | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.10

(aa) **^siconoscope, >**

MS 47480-193v, ScrTsLPA: ^{^+through the iniconoscope stealdily+^ | *JJA* 55:106 | 1937 | II.3§4.4 | *FW* 349.19}

(ab) **^rcharge of light, >**

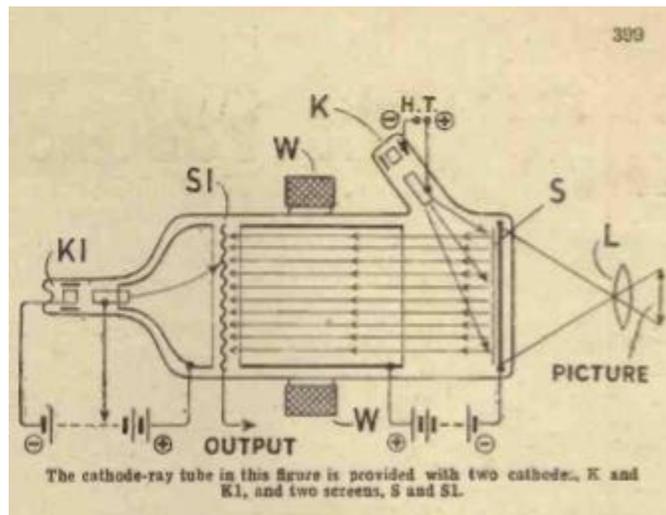
MS 47480-63, ScrTsIns: a ^{^+the+^} charge of a light barricade. | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.11

(ac) ^gcarrier wave

Popular Wireless, Dec.25 1937, [Light and Electrons] 399a,b,c: **Application to Television**

[...] Suppose, for instance, that one side of a specially prepared screen is **bombarded** by primary electrons, so that it gives off a uniform cloud of secondary electrons. Then a ray of light focused on the other side of the screen is found to regulate the strength of this cloud, making it stronger or weaker as the light itself changes in intensity.

The action is illustrated in the accompanying Figure, which shows a cathode-ray tube provided with two cathodes K and K1 and two screens, S and S1. The first screen S is made of a very thin sheet of oxidised aluminium, which is covered with a **coating of caesium**, only one molecule thick. When such a screen is **bombarded** with primary electrons, it will liberate many more secondary electrons from the surface in the ordinary way, but the number given off at each point can be regulated by the intensity of a ray of light focused at a corresponding point on the reverse side.



The purpose of the cathode K and its associated “**gun**” is to “**spray**” a stream of electrons equally over the inside face of the screen S, so that a uniform emission of secondary electrons takes place from every point of its surface.

If the picture to be televised is now focused on the outer side of the screen through a lens L, the different light-and-shade values of the picture produce a change in what is happening on the other side.

The uniform cloud of secondary electrons is at once broken up by the effect of the light, so that the electron stream now varies in density from point to point. That is to say, the different **tone values** of the picture begin to show themselves as variations in the strength of the stream of electrons coming from the inside face of the screen.

The first point about all this is that the feeble energy of the ray of light from the picture has been replaced by the energy of a fluctuating stream of electrons.

The second and more important point is that the stream itself has been produced by secondary emission from the screen S, and is therefore altogether of a higher order of density than the ordinary or primary emission produced when light acts directly upon a **photo-sensitive** surface. The net result is that the effective energy of the original light has been “**stepped up.**”

Once having made this step-up transformation, the production of television signals follows the usual course. The stream from the screen S is focused by an external magnetic winding W on to the **photo-sensitive** screen S1, which is similar to that used in the **Iconoscope** “camera,” except that it is double-sided.

The **charges** produced by the stream on the inside surface are therefore repeated on the outer surface of the screen S1, where they are scanned by an electron beam from the cathode K1, and used to modulate the outgoing **carrier-wave** in the ordinary way.

MS 47480-63, ScrTsIns: borne by their carrier + carrier + wave + valve. + | JJA 55:107 | 1937 | II.3§4.4 | FW 349.13

(ad) ^rfading,

?*Popular Wireless*, Dec.25 1937, [JOHN WATT'S PLANS FOR THE NEW YEAR] ivc: The progress made in valve technique was followed by the use of automatic volume control to overcome the effects of “**fading**” on long-distance reception, whilst various other refinements, such as automatic tuning control and variable selectivity, gradually brought the receiver to its present stage of development.

Meanwhile high-**definition** television made its appearance on the ultra-short waves. Although television is not included in the present survey, the opening-up of the wave-band below 10 metres is too significant a fact to be ignored. It clearly points the way to the future broadcasting of ultra short-wave “sound” programmes, partly in order to relieve congestion on the medium and long waves, and partly to provide programmes of a definitely-higher musical quality than those to which we are now accustomed. MS 47480-63, ScrTsIns: [Following a fade of transformed | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.07

(ae) ^rsync / pulses,

MS 47480-63, ScrTsIns: Down the photoslope in syncopanc pulses, | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.11-2

(af) ^rslopes,

MS 47480-63, ScrTsIns: Down the photoslope in syncopanc pulses, | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.11

(ag) ^slogged,

MS 47476a-216, ScrPrBMA: ^{^+(his electrosophonious ^+electrosophonious+^ photosensation under supersonic light control may be logged for by our none too distant futures as soon as tone values can be turned out from Chromophilomos, Limited at a millicentime the microamp),+^ | *JJA* 49:455 | early 1938 | I.5§1.11/4.11 | *FW* 123.13}

(ah) definition,

(ai) ^rguranium satin,

MS 47480-63, ScrTsIns: taut guranium satin, | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.10

(aj) ^rtelavicious nieces

MS 47480-63, ScrTsIns: he confesses to all his tellavicious nieces. | *JJA* 55:107 | 1937 | II.3§4.4 | *FW* 349.29