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ERNST STEFFEN

Telecinema in the Home

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Translated by Alex H. Bush.

Like the article by Arthur Korn (no. 270), Ernst Steffen here sees television as a blend of film and radio technologies and distinguishes between live transmission (television) and the transmission of recorded material (telecinema). Steffen's article focuses specifically

on the impact such technologies might have on the domestic sphere. His musings on the possible combinations of television with the telephone anticipate subsequent video-phone systems such as the *Gegensehn-Fernsprechanlagen* first inaugurated in Germany in 1936, AT&T's Picturephone system of the 1960s, or Skype today. But they also draw on earlier ideas such as the "telephonoscope," which had been discussed since the invention of the telephone in the late 19th century. *Daheim*, which ran from 1864 to 1943, was an illustrated magazine for families in the vein of *Die Gartenlaube*.

Things we once had to go in search of are now coming to us in our homes. Anybody who wanted to hear music had to go to a concert hall; people who wanted to listen to a lecture by a famous man went to a lecture hall. We could experience various kinds of gatherings or festivities only by visiting them. All these efforts and many further ones have now been eliminated by radio. Through its loudspeaker, we hear the voices of the most renowned artists; we follow the progress of operas, operettas, and dramas; announcers come to the microphone in succession. We all experience great events in detail through the vivid descriptions provided by on-site correspondents. Radio knows no boundaries. Anyone who possesses a good receiver can access the most diverse pleasures from faraway places.

But despite these many advantages, the radio is still missing something. Who among us has not wished not only to hear but also to see! It is certainly nice when a good announcer's lively depiction allows us to experience a horse race at least in our imagination. But it would be even better if we could see the horses, their riders, and the audience for ourselves. We are charmed by an artist's singing. But even the most majestic sound is improved by the sight of the performance and the facial expressions. That is why we wish to see the singer. There are many more such desires: how is the story executed on the radio stage? How does this or that maestro conduct? And so on, into infinity!

The idea of "television" was born from these wishes. If we could transmit acoustic impressions, why shouldn't we also be able to broadcast optical ones over great distances? Technology picked up on this idea. From the beginning, it was clear that there were two possibilities for its realization: We could either capture events live, in the moment that they transpired; if something was happening in one place, it would appear simultaneously everywhere in the broadcasting network. Or we could record the action first on a filmstrip. Then, instead of being shown to a limited audience on a cinema screen, the images could be sent into the distance. They could either appear in many theaters simultaneously, or anyone who possessed the right kind of receiver could watch them at home. If the images were transmitted live, it would be a case of pure "television." If they were recorded on a filmstrip first, the result would be "television." The first case created an impression of immediacy, but one that was over as soon as the action ended in reality. In the second case, the recording had the advantage of being able to be played repeatedly, as often as desired: the event or the play was permanently fixed. Thus if actual television is like a radio broadcast of a song, which has already faded away in the very moment that it rings out toward our ears, television is like a record, which picks up sound and preserves it for the future.

Technologically, the paths to television and television design are more or less the same. Enormous difficulties had to be overcome. Anyone who was interested in the subject understood that television and television were really nothing more than accelerated photography. We have known how to send images across wide distances, both by wire and wirelessly, for a long time now. But the transmission still demands a considerable amount of time. Television and television will be possible only once an image can be tel-

ographed so quickly that all its individual parts appear before our eyes simultaneously. One has to picture the image broken up into all its minute individual parts. One must imagine that a dense network of vertical and horizontal lines has been drawn through it. It looks like a wall, composed of individual bricks. These "building blocks," these "photographic elements," these "image points" are lined up one beside another. One is light, another is dark. Thus the "brightness values" have to be accurately rendered. Until now, we assumed that a face, for example, has to be broken down into ten thousand image elements in order to be recognizable by the receiver.

The first television apparatuses were large and heavy; they looked like giant machines. Accordingly, they were exceedingly expensive. If "telecinema in the home" was to become a reality, it was necessary first and foremost to design a simple and cheap receiver, which would be affordable for the broader public. Furthermore, it was necessary to set it up in a way that would make it very easy to use. Finally, the possibility of transmitting images on a single frequency had to be taken into account. Under certain conditions, many image elements necessitate many frequencies, as they cannot be sent quickly enough on a single one when they travel in sequence.

Dénes von Mihály, a radio technician in Berlin, has now discovered the solution to this problem.¹ His receiver consists of a box with an opening in it. The image appears in this opening, which has a little funnel-shaped frame on it. The only purpose of this fixture is to block the light rays that would otherwise hit the image from the sides and weaken its appearance. You can also darken the room in order to prevent light from windows or lamps from getting in. But this is certainly not necessary. The image appears clearly even in bright lighting. A knob on the receiver can be used to turn on the machine. The viewer turns it until the image appears in the box opening. After that, no further settings or adjustment controls are necessary. The film rolls steadily for hours. The receiver can be connected to any radio receiver. Transmission requires only a single frequency, because, as we now know, 1,000 to 1,400 image elements are enough to receive a clear picture.

The sender is just as simple as the receiver. It is made of two parts: one is a regular film projector, the device used to project images in quick succession onto the screens of movie theaters. The regular projector enlarges the images. In telecinema, they are scaled down through a system of optical lenses and cast not onto a screen but onto a transmitter. This contains a rotating disk with small holes along its edge. The light of a lamp is projected onto these holes. Hence one light ray goes through each hole. Numerous rays of light flit over the image and hit the image elements. It is just as though one were brushing over the image with a large number of paintbrushes. Rays of light that fall on dark image elements become darker, while the ones that strike lighter images stay lighter. Thus the light rays become transmitters for the brightness values. The light rays that have gone through the film are converted into electric currents of corresponding strength. Every brightness value corresponds to a specific current intensity. Then the currents are sent across distances either through wires or wirelessly. On the receiving end, they are converted back into light by being conducted through a lamp that shines on the opening of the receiver box.

The images transmitted through Mihály's receiver give reason to hope that cinema will soon be as common in the home as radio. We have indicated that transmission can be achieved through wires as well as through radio waves (that is, wirelessly). Today we have come far enough technologically that, generally speaking and within certain bounds, anything that can be sent by wire can also be sent wirelessly across long distances. In the future, perhaps our telephones will also have viewing openings or picture frames, where the person we are speaking with will appear. In business deals, for example, this will be a way for us to see prototypes or models from distant locations. We

will also be able to see the faces of faraway family and friends. Of course, some people, like those who now hurry to the television in their pajamas when their sleep has been disturbed, will be upset by this invention, because they will have to get properly dressed with coat and tie in order to make a good impression. Surely technology, in its wisdom and foresight, will bring devices that allow us to turn off the picture when we see fit.

Note

1. On Mihály (1894–1953), see the text by Arthur Korn earlier in this chapter, no. 270.