



# RADIO NEWS

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## TELEVISION TO THE FRONT

By HUGO GERNSBACK

WITH the official recognition of Television by the Radio Commission, as well as the actual successful demonstration early in April by the American Telegraph and Telephone Co., it may be said that television has finally arrived. The Commission, in setting apart the waveband of 150 to 200 meters for television, and particularly television for experimental purposes, recognized that one of the greatest, long-awaited and predicted inventions of modern times has at last come to the front.

It is interesting to note, in passing, that RADIO NEWS' sister magazine, SCIENCE AND INVENTION (then called *The Electrical Experimenter*), was the first to use the term "Television," in many articles on this subject which it has been publishing for some fifteen years.

To the layman who does not as yet know what television is, I may say that the term describes an electrical process, whereby it is possible to see at a distance and to view distant events as they are taking place. In this way television does for the eye what the telephone does for the ear. Your friend, using the telephone, talks to you from his office, while you are sitting in yours; while the television process is comparable in that you will see your friend as he is talking to you, and, *vice versa*, he will see you.

I have said, many times before, that there exists some confusion in the public mind because there has appeared in the press the unfortunate term of "radio movies," which is a totally different thing from television. The "radio movie" is to television what the phonograph record is to the telephone. The telephone transmits and receives a conversation while it is being held; the phonograph records the conversation or the music, and it is then laid aside until it can be reproduced at a later date. Radio movies are in this class, in that an event is filmed or otherwise recorded and then transmitted at a distance by wire or by radio. I hold the opinion, however, that most likely radio movies will not be very popular in the future when once we have television—which indeed we already have.

When the term "television" is used nowadays, it means television coupled with radio, although there is, of course, no necessity for such a view; because if you have television by radio you can have television by wire, and *vice versa*. If television apparatus is perfected to such a degree that it becomes a commercially practical instrument, the telephone companies will not hesitate to make an attachment that can be used on your desk or home telephone. In that case you will be able to converse with your friend and see him at the same time, if this is desirable.

But, if, for instance, you are not dressed or otherwise do not make a presentable appearance, a button located in the telephone stand which starts transmission may be left unpressed; in which case you will be able to see your friend, but he may not see you.

Television, as far as radio is concerned, will extend the present benefits of radio tremendously. It is recognized by every one that, inasmuch as radio is "blind," an entirely new world will be opened to the radio listener if he can see as well as hear. It will then be possible not only to hear the President of the United States, when he speaks, but to see him as well. And the same thing will be true of Lopez and his orchestra, as well as of all the performers when grand opera is broadcast direct from the stage.

The race for television has been on for over twenty-five years, but it may be said that television became practical only during the past few years, since the invention of a light-sensitive photo-

electric tube. Heretofore it was necessary to use selenium as a light-sensitive instrumentality, which translated the light impulses into electrical ones. It was found, however, soon, that selenium is too slow, because of its inertia, and television apparatus constructed with selenium cells gave no practical results. The photoelectric cells, of which there are now a number of excellent types, have no inertia or lag, and work practically with the same speed as the variations of light. At the sending end of a television apparatus we have at the present time the mechanism of a rotating disc with lenses (or just plain holes), which cuts up the picture successively into points, the impressions of which are then transmitted either by wire or by radio.

At the receiving end a similar apparatus is used, in which the incoming impulses react on an electric-light bulb, which, being usually of the gaseous type, responds with the speed of light to the variations that come into the receiver. Here again, we have a revolving disc with lenses, whereon the light of the aforementioned lamp impinges, and through which the picture is reconstituted on a screen. I have used the word "picture," but it

should be understood that the "picture" may be the face of your friend, while he speaks, or of a baseball player while he plays. Of course this is only the roughest popular outline of a television apparatus, and there are many minor steps which are quite important, but which have not as yet been solved to the satisfaction of our engineers.

For one thing, we require a motor at the transmitter to rotate the disc with its lenses, while a duplicate motor is needed at the receiver to drive its disc and lenses. The ticklish part of the problem has always been, so far, to keep the two motors running in exact step; because the smallest variation in the speed of the motors (that is, when the two motors run out of phase), will cause a blur at the receiver, and the received television picture on the screen will be distorted and a total loss. It is believed that in time the rotating disc will be done away with entirely and that some vibrating medium, perhaps, will be used instead; whereby it should be possible to have perfect synchronization of both transmitter and receiver.

There is one thing that is certain, and that is that the race for television is at the present at its maximum of effort. All the big technical research organizations, the world over, are frantically working on the problem, and it may be said that the organization or inventor who solves the problem in the most practical way will have an invention that will far outrank radio as we know it today. Even as late as five years ago it was thought that a television attachment would probably be a most cumbersome apparatus. We no longer think so today, and I am quite certain, for one, that the final television apparatus on your radio set will take up no more room than your present cone speaker.

And, while I am delighted with the decision of the Radio Commission to set aside a special band for television experiments, actual television as applied to radio will not need an extra waveband. The reason for this is very simple, in that the television impulses can be sent out by the present broadcast transmitters without any trouble. They will be sent out on exactly the same wave at a frequency (of modulating vibrations) so high that the human ear can no longer hear the result. The process will be then reversed at the receiver, where the inaudible signals will be fed through a system of intermediate and step-down transformers, where they will be used for the regular television reception methods.

*Wherein the Editor rejoices over the official recognition and practical demonstrations that Television has arrived—and dips back into the days when it was in the field of prophecy—pausing to explain what Television is—how it gives us the history of the present moment—while the "radio movie" tells that of yesterday—how Television may be by radio or an attachment to your wired telephone—and how it may be made an integral part of broadcasting without encroaching farther into other wavebands—yesterday's "impossibility" is tomorrow's necessity.*

Mr. Hugo Gernsback speaks every Monday night at 9 P. M. from station WRNY on various radio and scientific subjects.