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Radio Television

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I AM frequently asked this question: "What, in your opinion, will be the next great development in Radio?" And to this question I always answer that, in my opinion, the next and most logical step in Radio will be the establishment of "Television," or the power to see objects at any distance, through the same medium by which we are now enabled to hear sounds by radio from all over the world.

Radio receiving sets have been developed to such a high degree that we need not expect any revolutionary improvements to be made in them for some years to come. The radio receiver is now at the stage of development such as the automobile reached ten years ago. The improvements made since then in the automobile have been only in the refinement of its various parts; and it will prove exactly so with radio.

So, when I speak of Television, I do not predict a novel type of radio set *per se*, but rather the creation of a device which can be attached to your radio set. It will be similar, in its relation to the present radio set, to the loud speaker, which can be connected to your set, regardless of whether the latter is of the vintage of 1923, or the latest 1926 model.

This may seem to be a rash, offhand statement, but a moment's consideration will show that it is not. For instance, you can listen to a full orchestra with your radio set and (providing you have good transformers and your loud speaker will take both the upper and lower ranges) you will find no trouble in distinguishing the notes of the bass drum from those of the piccolo, even though both are playing at the same time. In other words, you hear simultaneously a number of different instruments without their interfering with each other.

Through the future application of Television, it is quite logical that while a station is broadcasting a song, you will be able to see the face of the singer at the same time, through a transmission on the same wave to which you are tuned in, for the following simple reason.

The range of acoustical frequencies is really very narrow, and does not take in a wide band; the human ear responds to no vibrations above a frequency of 23,000 per second. That is the reason why the so-called radio "carrier" is inaudible. To the non-technical reader it may be explained that the "carrier" is the fundamental wave emitted by a broadcast station, which is on the air at all times when the station is transmitting. When no one is speaking or singing at the broadcast studio, you hear nothing but a faint rushing sound in your receiving instrument. The vibrations of this carrier run into millions per second, and that is why we cannot hear them directly.

If however Television is perfected (as it almost surely will be during the next two years, or perhaps sooner) it will be possible to impress the Television impulses upon this same "carrier" which brings the sound impulses to your set. The Television impulses, being of a frequency too high to be audible, will not interfere with your loud speaker; and the Television picture for the same reason, will not be mixed up with the speech, any more than a violin or a piano, both of which you can readily distinguish with your ear. This is an inadequate comparison, because the separation between the acoustical band or audio frequencies and the radio frequency band is enormously wider than that between any two audible notes of music; and it will therefore be practically impossible for the "sight" waves and sound waves to interfere with each other.

I have pointed this out to bring home the point that, when Television is finally brought about, it is quite probable that today's radio sets will be adapted to this new purpose; and that it will be possible to connect a Television attachment right to your present set and thereby see what is going on all over the country while you are enjoying the program. Not only will it be possible to see the

entertainers at the broadcast station to which you tune in, but everything that is broadcast for sound only, today, will be broadcast by "remote control" for Television as well.

Radio Television, it must be said, is nearer at hand than most of us realize. The inventors of the entire world are racing frantically for the goal, because they realize that in Television they will have created a great new emancipator, much greater than the telephone or radio communication itself.

In this country C. Francis Jenkins has been in the foreground in Television experiments; and he has achieved success in making it possible to transmit and receive the outlines of moving objects by radio at the present time. In England, it is reported, John L. Baird, who has been on the same track, has accomplished a great deal; in France Professor Edouard Belin has also produced results, and similar work has been done in many other countries. Television is now "in the air," and I shall be very much surprised if this great new art does not step out of the laboratory into every-day use, sometime in the next two years, or less.

Back in 1915, and again in 1918, I wrote a series of articles on Television which were the first, I believe, published in the technical press. At that time we had only the selenium cell as a "photo-electric" or light-sensitive substance; but it is sluggish and does not follow changes of light with sufficient quickness. It has been superseded recently by some very excellent light-sensitive cells, which react to changes in less than one ten-thousandth of a second; and this improvement makes Television an assured possibility today.

We should not be surprised, also, when the final apparatus is evolved, to note with what simple instruments Television can be accomplished. It is my belief that the successful device will be simpler and of fewer parts than our radio receivers are today, and it is quite possible that within the next ten years \$50 will purchase a complete Television attachment which will perform well.

To be sure, for a long time to come, transmission will be only in black and white, giving an effect similar to that seen in motion pictures now. Color transmission will come later.

At this point I desire also to correct an erroneous idea about Television, which is much in vogue now. Many people think of Television as "radio motion pictures." Of course there will be no motion picture equipment of any kind in the radio Television apparatus. Television does not concern itself with such methods at all. *In reality you will see at a distance*, just as if you had a telescope through which you could observe anything going on in any part of the country.

Television between broadcast stations and the broadcast public will become very popular. If the telephone companies wish, they can make simple attachments for the present-day telephone, so that you can see the person at the other end with whom you are conversing. A lot of people will throw up their hands in horror at this idea, because the idea of Television added to the telephone will suggest a reduction of their privacy to the minimum enjoyed by a gold fish. This need not be feared, however, because a pushbutton in the telephone mounting will insure that the party calling cannot see you unless you wish it. This is a very simple detail.

As to radio Television between private parties, such as depicted on the front cover of this magazine, I must admit that this lies much further in the future—perhaps twenty-five years or more, for there are not enough wave-bands available to make it possible for thousands to talk to each other at the same time. On the other hand, the cover illustration could readily represent two radio amateurs, who can converse by radio telephone even today; and if, in the next two years, they are enabled to place Television attachments on their radio sets, there might easily result such a situation as shown on the cover. But the individual application of Television, to every one's personal convenience, will not be practicable for many more years.

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

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