

Coming Developments in Radio

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. . . in which the Editor points out that there have not been any revolutionary improvements in radio and it is likely there will not be any; wherein it is shown why lectures and talks of more than 15 minutes' duration are not popular; in which this is analyzed; that the reason for it is the static "mush" sound background, making listening difficult; and how it is hoped that in a few years this deficiency will be overcome . . .

IT is well known that for the past few years, no revolutionary improvements in radio or revolutionary radio inventions have been created. Old, well-tried-out, and reliable devices, which have been known to the art for many years, have been perfected gradually; and the development of radio receivers, today, may be said to follow very much along the same lines as that of the phonograph and the automobile.

It is this process of slow evolution that we may expect in the future, as well, and the old adage also holds true in radio: "*Natura non facit saltum*"—which, translated, says that Nature does not make jumps. In other words, all developments are part of a slow-moving plan of evolution. Even revolutionary inventions, when they do come along, will be found in the end to be not half as great a departure as they were thought to be at first.

When broadcasting was initiated, the prediction was freely made that radio would soon become a tremendous instrument for the purposes of education. It was foretold, on all sides, that every school would have radio outfits installed, by means of which the pupils would be instructed by lectures from a central place, where some men of great eminence would lecture, so that the classes all over the country would get the same information simultaneously.

While this idea is feasible in theory, so far it has not been put into practice; though the question is often asked by many people in all walks of life, "Why is there not more instruction and more education from our big stations?" Let us analyze the problem, and see what really is wrong. We find at once that very few stations today give any great number of lectures. If these are given, they are usually limited to fifteen minutes' duration, and very seldom run much longer. The broadcast directors seem to have acquired from experience the idea that a listener will not stand for longer talks than fifteen minutes; and many directors maintain that even this is too long.

On the other hand, the majority of listeners, when questioned, will tell you that they wish to be entertained, or that, if they do listen to lectures, these tire one too quickly. The latter statement is full of meaning for those who can read the signs aright.

Let us take a typical case. You sit in front of your loudspeaker and listen to a highly instructive, important lecture. Or if you wish to observe scientifically, try it with one of your friends. Then watch his face carefully, and you will find that at no time during the lecture is he completely at ease. He has to strain to catch the words as they come from the loudspeaker, and very often an annoyed expression will come over his face. You can tell from his features that he is not being entertained. *It is really hard work, nowadays, to listen to any lecture,* throughout the greater part of the year. There are seasons when it is not quite so difficult: but we must be frank in admitting that during most of the time we would much rather listen to music, for we do not have to strain our attention to follow the motif, as we do when listening to a more or less dry lecture.

What is the reason for this? Let us presume that the radio set is not at fault, or, at least, not greatly. Let us also presume that we have a first-class loud-speaker, which reproduces perfectly. Then, what is wrong?

The answer is simple. Turn on your radio set at any time during the evening, and set it at a point on the dials where no station is audible. You will immediately notice a background of sound "mush," whose intensity depends greatly upon your location, the season, and many other conditions. If you are located in a great city, all the man-made static in the neighborhood will be collected on your aerial or loop, and will make itself heard in the loud-speaker. Every time some one lifts a telephone from its hook, every time some one rings a bell, runs an elevator, starts his automobile or tunes his radio, every time a trolley car passes by, and from many, many other similar electrical disturbances, a slight noise is produced in the loud speaker.

Then too, atmospheric electricity makes itself known by even louder noises in the loud-speaker. Of course there is not always an abundance of static; but there is always some static electricity in the air, which, even during the best season, makes some impression upon the loud-speaker, loud enough to be heard.

The conglomeration of all these static noises comes out of the loud-speaker at the same time as the reproduced words; and in this fact the present deficiency

of radio sets lies. We have no means as yet to stop this so-called static “mush,” which blends with the transmitted voice, making it hard for us to understand perfectly the spoken word. The conditions are the same as if some one were speaking in a large room with every one else talking at low voice, making it almost impossible to understand the orator, or possible only with difficulty. At such a time, listening is no longer a pleasure, but becomes hard work.

In the modern radio set, furthermore, we have another producer of disturbing sounds, and that is the vacuum tube. Marvelous instrument that it is, the tube is not perfect, for nothing in this world ever can be. The radio tube, due to its inherent sensitiveness, also gives rise to characteristic sounds commonly known as “tube noises.” Even without the static “mush” background, there are always noises produced by the tubes themselves. Every time a metallic particle is thrown off from the incandescent filament inside the tube, a noise is caused in the loud-speaker. There are various other tube noises, such as those produced by the slight jarring of the building in which the radio set is located, by temperature changes, etc. All of these causes give rise to some little current impulses, which, being amplified, produce a “noise level” of their own in the speaker.

As long as all of these disturbances prevail, it will be impossible to put on lectures that can be enjoyed by a very great number of people. While the imagination has to work hard to supply the missing words which the ear does not catch, studying by radio is too much of a task: and the public would much rather listen to music and other entertainment.

It seems to me that the greatest task of the radio engineer at the present time is the elimination of the extraneous, parasitic noises, which now issue from every loud-speaker over the whole world. Nor is the task hopeless. It seems possible that it can be accomplished by the use of correct filter circuits, installed in the radio sets. We already know that static, whether natural or man-made, is of a certain frequency; and it should be possible to suppress any such frequency by methods similar to those used today in our “A” and “B” eliminators, in which the hum and other undesirable noises are filtered out successfully.