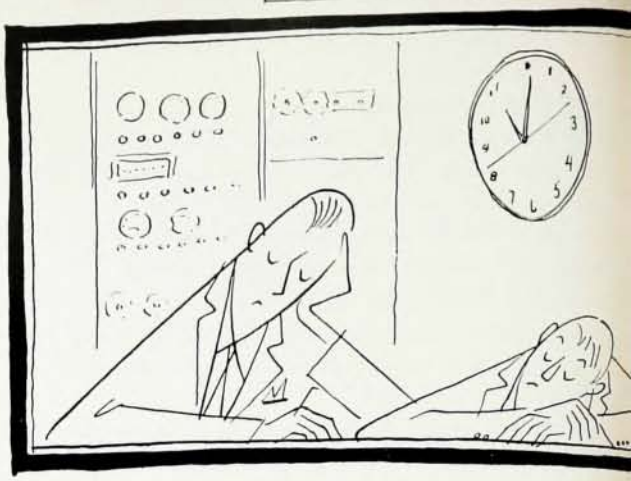
If science wants a mass radio audience, it must compete for it using radio, not classroom, techniques.



SCIENCE ON THE AIR

by ***John E. Pfeiffer***

It is a bare fact, whether or not one finds it an unhappy state of affairs, that a soap opera or a quiz show regularly attracts millions more listeners than a broadcast on any field of science. Naturally those responsible for putting broadcasts on the air shy away from the very word science in their program planning. The blame, of course, lies with radio for not devoting more time and energy to popularization—and with the scientists themselves for thinking too much about what they want to say and not enough about the people who are supposed to listen to it. It should surprise no one that the joint efforts of radio and the scientists have been so widely unheard.

On the positive side, there is no doubt that the next four or five years will see many more programs devoted to science. Atomic energy, radar, and other wartime developments have created wider potential audiences than ever before, and the new interest is more than a fascination with gadgets. It is based on

the increasing realization that science by its very nature has an effect on world affairs. Control of atomic energy and the supplying of more accurate weather forecasts are simply two of the practical problems that demand the coordinated international action of scientists and government officials. Because of its social impacts, science will necessarily be involved in an increasing amount of national and international legislation, and the more people are aware of its meaning, the better that legislation will be. Science broadcasts will increase—and they must reach as large an audience as possible.

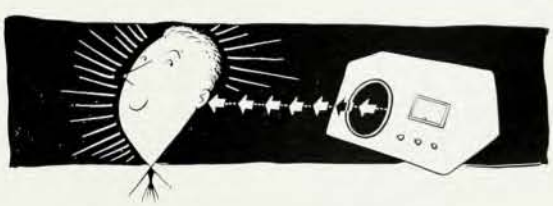
But reaching mass audiences is not going to be easy. The listener has his choice of a wide variety of competing programs. To put it in its broadest and most discouraging form, the listener may be compared to a person watching a football game and suddenly feeling a tap on his shoulder. He turns around to see who's tapping, and finds his interrupter is a nuclear physicist, who had better have something definite and dramatic to say if he wants to hold attention. Of course, if the listener is more interested in nuclear physics than in football, there is no difficulty at all. Programs already exist for people who prefer serious discussions of science and other matters, and they will continue to be presented for special groups of listeners who can take their education straight. But the challenge to scientists and to broadcasters is the people who don't listen. If they are going to be reached, both groups will have to help.

The Trouble With the Scientists

The scientist can contribute a great deal more to popularizing science on the air by recognizing that some of the things that make him a scientist may cut him off from the people he wants to reach. He deals with facts. Radio is essentially a poor medium for facts. It is a tremendously powerful medium for imparting attitudes and feelings; intonations and intensities get across to all listeners, facts to very few. An important fact will be lost if the voice expressing it is dull, and will be resisted if the voice is in some way unpleasant. Utter nonsense will assume the aspects of deep truth if the speaker is enthusiastic and sincere. Furthermore, most people are not trained in remembering by ear, especially in the atmosphere around a living-room loudspeaker.

This does not mean that only factless programs can appeal to mass audiences. It means that the facts must be few and carefully selected to make a single key point, that the fact-density per thousand words should be low and most of the words devoted to elaborating and repeating if necessary. If the aim in a single program is to hit hard concerning the international control of atomic energy, for example, the secret is to list the ten most significant points in the argument—and then eliminate all but one of them!

The process may involve psychological blocks. You may state with complete truth that one point cannot convey the strictly logical aspects of your argument. You may object that one point is totally inadequate to convey the enormity and urgency of the problem. You may want to give up all the subtleties and go ahead and make your ten points. But by and large you will be doing a better job to reach a lot of people with an important part of your argument, powerfully presented, than to reach a few with the whole works. To make ten points, use ten programs.



But there is an even more potent audience-killer than the scientist's natural tendency to present many facts and make many points. Inevitably the scientist learns a great deal about his chosen field and becomes an expert in a highly specialized subject. He is an authority at home in his living room, at parties, and in the auditorium. When his own field or any scientific subject comes up, laymen listen to him with respect, and sometimes with awe. Most laymen are too self-conscious about their own lack of training to reveal their ignorance by asking the simple questions that might really clarify things for them; no layman, of course, feels that he knows enough to argue or contradict.

This is not good for the scientist. No matter how carefully he guards against it, he cannot help slipping into a role of authority and enjoying the prestige of wondering faces and starry-eyed disciples. Aside from the fact that science's very existence is based on a repudiation of this sort of thing, there is another objection. It is so much easier to impress than to teach that eventually one is likely to forget the distinction and confuse rapt attention for comprehension. This danger is particularly evident in the lecture hall, where the scientist addresses audiences according to a deep-seated convention—the platform ritual. After a properly flattering introduction, he makes his talk from a platform; he is always talking down literally, and often figuratively as well. There is some time for questions before the meeting is over, but the atmosphere is hardly give-and-take. Even with a skilled, enthusiastic and sympathetic speaker, the audience has spent an evening of listening—and listening by itself is not a way of learning.

This situation is bad for the scientist because it tends to blind him to the problems of popularizing, but it is even worse for the layman. The impressed but unenlightened person is rarely a happy or useful citizen. Behind his respect for science and his conviction that something ought to be done about atomic energy and other matters, he feels that the facts are too complex, that a real appreciation of research is not for the likes of him. Often, instead of being stimulated to learn, he is discouraged, and the discouragement may turn into resentment, because no one likes to feel that he cannot understand important things. Yet the scientist often unwittingly fosters such feelings; he has been too isolated to get his full message across to mass radio audiences.

The Trouble With Radio

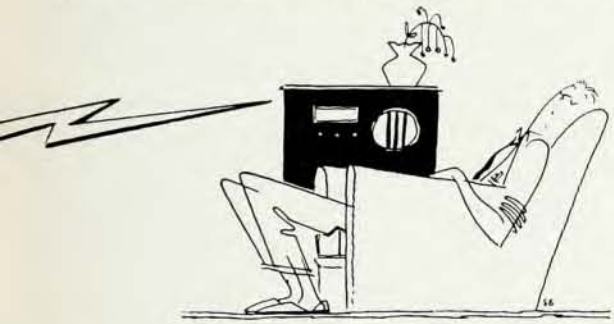
Radio, on its side, has not yet realized that putting science on the air is important enough to warrant some extra effort. The large newspapers and newspaper chains have science editors and reporters, and devote special attention to the coverage of important meetings. But of all the major networks the Columbia Broadcasting System is the only one with a science department, and the only one to give full-scale coverage to a scientific convention (last December's AAAS meeting in Chicago). Many stations are still at the stage where they think that the really big stories in science involve multiple births or babies born with upside-down stomachs.

The tendency is to take science broadcasts ready-made from the scientists, and that is a sure way of frightening away listeners. When the broadcasts go on the air, and show the inevitable low Hooper ratings, radio shrugs its shoulders as if to say, "Well, that's science for you—it doesn't sell." Science programs are aired for policy reasons as a public service and no one bothers to make them much more than that—a slightly modified version of lectures with all the trappings of the platform ritual, and minus the benefits of being able to see the speaker's gestures and expressions.

The platform ritual infects almost all science broadcasts, even those that are not presented as straight talks. The interviewer often takes one of the scientist's talks and 'edits' it—which means he intersperses it with strategically placed questions: "When did you start this interesting research, Professor Smith?" "Can you tell us a little about that in terms that the layman can understand?" "That's very interesting, Professor Smith. Now what new benefits does your research promise to mankind?" The interview—usually and fortunately restricted to about fifteen minutes—proceeds with a forced, creaking spontaneity that is far worse than straight formality. Again, this may be fare for patient and

pre-interested listeners, but the grand illusion in radio is that it is popular science.

Even the most creative form of popular science on the air—the drama—is not free from the course of the platform ritual. The script is prepared by a writer who also does mystery melodramas, soap operas, and other radio shows. As often as not the script is dramatic, well-paced, and has a good deal of human appeal—except for the inserted talks. These come at the moments when a scientist interrupts an interesting scene to give the less-learned



characters certain vital facts that will change their entire way of thinking and living. Even if the writer omits these dragged-in talks, you can usually count on the educators to have them written in. Audience-reaction surveys show that listener interest takes a marked drop at such points, which presumably means that a good part of the audience is turning the dial to less educational but more entertaining programs.

Science drama is frequently afflicted with another device known as the flashback, the journey back through time. In format and tone flashbacks boil down to acted-out historical talks, and cannot conceal the fact that the broadcast's structure is fundamentally that of the classroom lecture. Dramas using this faintly archaic technique customarily start out in the present tense (so far so good, since most listeners happen to be living in that tense). The action, say, involves the peacetime use of ship-borne radar to avoid collisions in the fog. Then the narrator, a lecturer in disguise, cuts into the show to tell all this would have been impossible if it hadn't been for the pioneer work of a man who died many years ago, Clerk-Maxwell. As the narrator's lightly pedagogical voice fades, the drama flashes back to episodes in the life of the physicist. He is deeply discouraged because for the time being one of nature's fundamental secrets seems to have eluded him. Then comes The Moment. A flash of insight clarifies the problems of electromagnetism; Maxwell has done it again! (MUSIC UP AND UNDER). The program then turns to the narrator again, who promptly launches the audience into another flashback or else winds up the program. Since dramas of this sort convey an amazingly large number of misconceptions in a rather brief period, it is just as well that they are not widely heard.

Some New Trends

These examples should emphasize the pervading effect of the formal presentation, the platform ritual, and the talk. Such programs cannot meet the urgent need to spread the ideas and attitudes of science. I would like to describe some experimental efforts at CBS to prepare science dramas with a wide appeal, the goal being to reach millions of people who are not listening now.

Usually the first thing discussed in preparing a science drama is the subject to be dramatized—one, but not the only logical procedure. The trouble with selecting a subject first is that the listener tends to become a distinct afterthought, and one always finds oneself scrambling for human-interest material to be injected into an essentially technical framework. A possible new approach is an audience-first technique. This means concentrating at the very start on some nontechnical field of human experience that, by its very nature, is interesting and important to people in their everyday lives. Then, with a subject already selected for its intrinsic appeal, there is no straining to inject human interest. The problem becomes one of finding scientific material that bears on the subject and can be worked naturally into a dramatic script.

Supposing we decide to devote one to a subject as down-to-earth and thoroughly familiar as arguing—can we make such a human subject "scientific" in any important sense of the word? Unfortunately, it would not be particularly difficult to find a good deal of exciting and plausible material showing how people are affected by appeals to prejudice and other irrational ways of making points. A well-paced human script could be prepared contrasting these opinion-influencing techniques with scientific methods of arguing from evidence as illustrated at a fictionalized meeting of a physics society or a modern electronics laboratory working on radar equip-

ment. The sharing and merging of viewpoints inherent in scientific group research would be pointed up in this manner. A program on arguing might also refer to popularized logical fallacies and indicate that there is a field devoted to the study of what makes arguments valid.

This is only one example. Science shows can be built from such familiar pursuits as getting a job, listening to music, reading, or playing games. But the main point is that the script writer and the person with scientific background are working together from the common ground of a subject that is human, interesting, and therefore naturally dramatic. Two programs on Columbia's *March of Science* series illustrate the audience-first technique in action. "Why We Laugh" dealt with some of the efforts to study humor on a scientific basis, and the radio comedian Robert Q. Lewis took the part of a fictional radio comedian. "Playing the Game" was a basketball script presented during the basketball season and involving all the excitement and appeal of any good sports story (including Red Barber playing a sports announcer role). The science in this program concerned the increasing use of muscular-coordination and reaction-time tests in research on athletic ability. Other *March of Science* dramas were constructed around such themes as fear, magic, sleep, and the family. Judging by preliminary reports, these programs have been of great interest to laymen and scientists as well.

Similarly, the conventional science interviews can be streamlined. They should be conversations without scripts, completely ad lib, but carefully thought out to present a clear argument line (and perhaps conducted in an atmosphere more informal than the average broadcasting studio). A representative of the public might well sit in on the bull session and I mean an honest-to-goodness layman. For example, if the scientist is an aeronautical researcher, the layman could be an airplane mechanic or an airline hostess; the radar engineer might speak with a radio factory worker. The point is to include in the discussion a layman who could not only ask some of the questions the listener might ask, but by showing his interest in certain points would help the scientist emphasize things that people want most to know.

There is another important aspect to the problem of putting science on the air. The more science news people hear, the more they will become familiar with research and the more they will listen to science programs of all types. Radio still has a lot to learn about the news value of research, but there are some encouraging signs. For many months now the American Chemical Society has been actively cooperating with radio stations throughout the country, and presents a regular science news program, "Headlines in Chemistry," over station WNYC in New York. CBS has a science-news series, "Frontiers of Science," in which Quincy Howe discusses important developments not only from the point of view of factual content, but emphasizing social and political implications. A great deal more can be done to give science news its share of attention.

Whether these or other suggestions become radio practice, science programs will be developed to appeal to far wider audiences—which means they will be more entertaining, and less dignified and formal. The gap between education and entertainment is synthetic; it can be reduced, if not removed entirely. Science and radio have a good chance to take the lead in this development. The goal is to have entertainment shows that include something worth being entertained about, and educational programs that are fun to listen to. Television will accentuate many of the problems already discussed, bring up new ones, and accelerate the finding of new techniques for large audiences.

But the future of popular science in radio—and in all other mass-communication media—is even more important to the scientist than to the layman. Unfortunately millions of Americans owe their present interest in research, their introduction to science, to headlines about the tremendous value of physics and other disciplines in the winning of world wars. In other words, they met science in uniform and will continue to associate it with uniforms unless they learn to appreciate its peacetime meanings—and the power of the method behind the discoveries. Radio is potentially the most effective medium for the popularization of the scientific attitude. And that, more than any fact or specific advance, is the thing we want to popularize.