

from buying a present-day radio set. We shall have time to buy three or four before we are able to buy a combined radio and television set.

In opening the demonstration of television given by the Bell Telephone Laboratories, April 7, 1927, Mr. W. S. Gifford, President of the American Telephone and Telegraph Company remarked: "... The elaborateness of the equipment required by the very nature of the undertaking precludes any present possibility of television being available in homes and offices generally."

The advance in the next ten years cannot help but be astounding. The invention is in its infancy and it is at this stage that most rapid growth takes place. Let us take the case of the modern automobile; let us assume that the progress of television is as far advanced. Could we expect much change in ten years? Dr. Charles F. Kittering, Director of Research for the General Motors Company, sums this up in an article in *Nation's Business*. His remarks are as follows:

"A few weeks back I was sitting with a group of executives. All were admiring a new model.

"'It is absolutely the best automobile that can be made,' enthused one. I objected to that statement.

"'Let's take this automobile which you say, is the "best that can be made" and put it into a glass showcase,' I said. 'Let's put it in there—seal it so no person can possibly touch it. Just before we seal it in the case let us mark the price in big letters inside the case.

"'Let us do that and come back here a year from today. After looking at it and appraising it, we will mark a price on the outside of the glass. It will be a price something less than what we think the car is worth today. Probably \$200 less. Then, let's come back once every year for ten years, look through the glass, and mark a new price. At the end of ten years we won't be able to put down enough

ciphers to indicate what we think of the car. That is, of course, eliminating its value as junk.

"'In those ten years, no one could possibly have touched the car. There could be no lessened value through handling. The paint would be just as good as new; the crank case just as good; the rear axle just as good; and the motor just as good as ever.

"'What, then, has happened to this car?

"'People's minds will have been changed; improvements will have come in other cars; new styles will have come. What you have here today, a car that you call "the best that can be made," will then be useless. So it isn't the best that can be made. It may be the best you have made and, if that is what you meant, I have no quarrel with what you said.'"

If this is true of the automobile, how much more is it true of television? How true has it been of radio in the last ten years? Less than ten years ago I tuned in my first home-made radio; a crystal, a few coils on a breakfast-food box, and some telephones. I heard WWJ from a point about forty miles from Detroit. It was remarkable! A parade of neighbors filled the house each evening. A face would light up with "Yes, I can hear it now." Today we expect an almost exact reproduction of the studio rendition. I was astonished when it was announced in our local paper that on such and such a night at such and such a time our electrical goods dealer would have on exhibition a loud speaker in operation. How could he be sure the set would work at that time? In fact what he got was simply a lot of squeals with a little music coming through. People were still working in the laboratories trying to send music over by a heterodyne system. A violin came across fairly well. A saxophone was not bad. But the two together sounded about as bad as one could imagine.

When we look at this situation is it possible to believe

that we can predict too much? The fact that wave-bands are now being set aside by the Radio Commission for television broadcasting shows how seriously the subject is being taken. There can be no doubt that television of moving pictures will soon come about. This brings up the problem of illumination only at the receiving end, instead of at both ends. But one broadcast station can serve many receivers so that expense need not be spared at the transmitting end. With searchlights now in use in aviation with beam candle power up into the millions we need hardly worry about this point. From movies to actual dramas will be but a short jump.

The chief difficulty at present is that television requires a rather broad band of wave-lengths. Had television come ten years ago this would have presented no difficulty. As matters stand now, however, with a broadcast station crowded into every possible space, the introduction of television will of necessity crowd some of these out. With their enormous commercial possibility, none are willing to drop out for the general good of the future of television. Here perhaps, lies television's greatest obstacle. It is probably greater than the various technical obstacles which have been presented in this book. In the meantime, the fact that there is no public demand for television magnifies this difficulty. If the public knew that it wanted television, if there would arise a vast army of enthusiasts such as those who built one home-made radio set after another a few years ago, then television would at least be given a hearing. But now a factory-made set is so much superior to one fabricated at home that most of these so-called fans have disappeared. As it is now we are waiting for a good factory-built television receiver. But will this come without public demand? We are met with the problem of public demand on both sides and it appears that this will only come as a result of press reports of laboratory demonstrations. It will be a

rather slow process. Television cannot win its way foot by foot; it must come as a more or less finished product.

Julius Weinberger of the Radio Corporation of America, speaking before the Federal Radio Commission, recently said:

"If the public is interested in purchasing picture or television receivers, and if commercial interests are desirous of setting up a service along these lines, it will be possible to set up and develop a better class of service with far less interference with the present sound broadcasting art if visual broadcasting service is placed in those bands above 1500 kilocycles. If this is done the necessary elements of standardization can be worked out at a reasonable and thoughtful pace and will develop so as to be of the greatest general public service."

Other speakers before the Commission were reported by the *New York Herald Tribune* of February 17, 1929 as follows:

"M. B. Sleeper, of the Sleeper Research Corporation, told the commission that television is no more annoying than any other program and the public is privileged to tune off any program it dislikes. He favored television programs in the broadcast band, and stated his belief that if sets were on the market the public would buy them. Under the present conditions, he said, most of those who have sets had to make them.

"Declaring that engineers developed all the great inventions and that statements made on television other than by engineers are of little value, C. W. Horn, manager of radio operations of the Westinghouse Electric and Manufacturing Company, told the commission that television will have no right on the broadcast bands until it has developed so that a moving picture can be shown. Television is now in the laboratories, he said, and not ready for the market, intense research work-still being necessary.

"Oswald Schuette, executive secretary of the Radio Protective Association, said the commission could do everything possible to encourage the development of television. He opposed the standardization by certain groups and asked that the independent manufacturer, inventor and others be given a free hand in the development of television. Colonel Manton Davis, vice-president and general counsel of the Radio Corporation of America, agreed with Mr. Schuette that 'development of the art should not be cramped.' 'Let us, if we can avoid it, not develop one radio art at the expense of another,' Colonel Davis said."

This probably gives us a fair picture of the present attitude toward television by those capable of passing judgment upon it.

Another difficulty comes in the lack of standardization. If one transmitter is working with a scanning-disc of forty-eight holes, another with thirty-six, two receiving discs would be needed. To shift from one station to another we should have to change the discs or make some equivalent adjustment. This is but one of several problems which lack of standardization presents. On the other hand, standardization at the present stage is dangerous. It is extremely difficult to change a standard, however undesirable it may prove, after the public has invested thousands of dollars in equipment.

But development goes on, and will go on. There is no question but that the technical difficulties will be overcome. This in turn will overcome the other difficulties which have been outlined. There is little question but that ten years from now we shall receive television broadcasts as readily as we receive radio programs today. And they will be relatively as satisfactory.

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