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Radio Movies

By Dr. C. Francis Jenkins

President Henderson introduced Dr. Jenkins as coming to the club through the courtesy of the Royal Canadian Institute to which he had lectured at Convocation Hall on Saturday evening.

Dr. Jenkins:—Many millions of years ago our first man made his first mental image so that his friend could see it by drawing a sketch probably on the cave wall of his dwelling. Today our movies give us a realistic reception of a distant scene, or present in motion, in color and with speech and music and appropriate sounds a realism of that distant scene which happened some weeks or days or hours ago, which no other instrument yet made has given us. There is the still further handicap of time and distance, so those of us who give this handicap some thought conceived it would be a good idea to apply radio to the problem of eliminating time and distance. Radio has neither. It is an instantaneous reproduction in Australia, and you in the farther part of the room hear me much less quickly than those who are listening by radio down in the States perhaps. So then if we could analyze the values, the advantages of radio in our problem, we have eliminated the two remaining handicaps, time and distance. So we began some ten years ago in a modest little laboratory down in Washington to try the problem, because nobody else was busy on it and it looked as if we had no handicaps or competition, and I am a great chap to pioneer things, because then the other fellow cannot criticize me; he doesn't know whether I am doing it right or wrong anyhow. If the operator will give us some lantern slides those of you who can see them will perhaps follow my remarks better than those who must listen only. Motion pictures today are simply a long series of lantern slides, run through a machine so rapidly that the

eye does not perceive the difference. When we go to the moving-picture show we see pictures all the time, apparently. As a matter of fact they are on the screen only half the time. So we must start with still pictures in our radio movies work because we have no handicap of time.

(Dr. Jenkins then screened pictures of apparatus used for different kinds of reproduction; of one lantern he said: "One time we broadcast a still picture from that lantern by ordinary telephone wires through to exchanges and it was picked up by Dr. Taylor of the Navy Research Laboratory and the chief radio officer of the post office department; this is the receiver we used on that day. It consists of a tiny spot of light thrown through two discs which gives that point of light a linear movement across the photographic plate at the far side of the picture; that tiny point of light goes across this photographic plate in forty-eight successive adjacent lines to cover the whole plate. Each line we may imagine divided into forty-eight parts."

Of another slide he said: "One of our first pictures, twenty-five lines to the inch. It shows you very clearly how each line varies in its density or blackness or perhaps its width, so successive lines build up areas of black, like the hair or eyebrows, but down in the collar the line is so thin that successive lines really didn't build up anything except what from this distance appears to be white. But now that we have fifty lines to the inch the quality of the picture is improving. More lines to the inch in this picture and a little better skill and a little better apparatus. Another fifty lines to the inch. Here the quality is improving probably because of greater increase in technical skill and machinery.

"Here we have one hundred lines to the inch and you see the lines have entirely disappeared. The picture is of a quality equal to most photographs. So we are beginning to get to a place where still photographs by radio are not of very much interest.

"But we did try to find practical application for the apparatus and so one day Professor Marbin, head of our Weather Bureau, and Capt. Hooper called at my laboratory and we talked about the feasibility of transmitting weather maps every morning to ships at sea. The weather bureau agreed to furnish us a map every morning, reaching down

into the Caribbean sea, with conditions of wind and sky, etc."

(Dr. Jenkins then showed various types of weather maps and said of their efficiency: "The 1926 hurricane shows on these maps three days before it struck Florida. I had predicted we would be able to receive weather maps through static so bad it would prevent the reception of code."

(Proceeding, he said: "We are actually broadcasting for more than two years now motion picture stories which are received in the United States, in Toronto and down in Mexico and Cuba. The best reception, of course, is nearer home. Denver gets excellent reception and that is a good many hundred miles away."

Speaking of radio and aviation, he said: "To see what could be done with radio aboard an aeroplane which did not have an engine wiring shield, I flew over the Allegheny mountains to Detroit and we kept in constant two-way communication with Washington, except across the skip zone from the Allegheny mountains to the Ohio River."

"I am convinced from ten years of work in this art and from the fifty years which have elapsed since the first concept of the present method of television and with all the scientific knowledge and money and time which has been spent in that fifty years, and particularly in recent years, that our method of reception is not the best. We can make beautiful small pictures, excellent half tones, without difficulty, but you cannot make a large picture. That is something wrong with the process, we have come to believe, and so a new method of reception is now in course of development in my laboratory down in Washington. We believe it is a better method than the present method of reception.

The present method of television broadcast is quite all right for the present time. May I just show you for a minute that the present method of television reception and radio broadcast reception consists of taking one tiny little point of light and sweeping it rapidly across from left to right in successive adjacent parallel lines to build up a picture. I will not take time to go into it very elaborately but in that method we are losing six and one-half million times as much light as we use; that is the light wasted is

six and one half million times brighter than the light that falls on your eye. That is an unfair handicap for any engineer.

We are going to substitute a new method; motion pictures would consist of a long series of still pictures pulled through the motion picture projecting machine in rapid succession. That is, our motion pictures today are simply a lot of still pictures put together in such a way as to deceive you, one every fifteenth or tenth of a second. If we now go back to ordinary magic lantern slides and conceive of them as pictures wiped off the slide, and forty-eight lines or dots across the surface, the dots being changed in their density by incoming radio signals, we have a new method, because we can put a picture on our lantern slide by the incoming radio signals and that occurs every fifteenth of a second. If we could make that picture fade out and put a new one there, not in a fifteenth of a second, but much more quickly, we could make motion pictures. That, gentlemen, is the basis on which we are working, and I myself feel the promise is very large.

We are now able to make one picture by magic lantern slide in a fifteenth of a second, but it won't fade out quickly enough. I was courageous enough to say Saturday night I would give $5,000 to anyone showing me how to make it fade. It takes two hours and we want it in one-tenth of a second. That is the only thing that lies between our present stage of development and the day when we shall be able to transmit from Hollywood motion pictures to all the projecting machines in the theatres; Hollywood transmitting pictures to the theatres by radio instead of by film as a carrier. Of course in a broader sense it means current events can be seen in your homes or in your theatre at the instant they are happening, which brings us back to my original thought, that the day is just close by when we will have eliminated the element of time from our method of picture reproduction, between the event and its reception in your home."

(Dr. Jenkins then concluded his screen showing with "slow motion" pictures, two hundred times slower than the actual events. Jumping horses, diving, pole vaulting, the throwing of a baseball, and the progress of a cannon-fired projectile, were screened.)