ADDRESS OF WELCOME

DELIVERED AT THE OPENING OF THE FALL MEETING AT SWAMPSCOTT, MASS., OCTOBER 5, 1931

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When I first knew of the meeting here, one thing struck me more than any other, and that was that I know of no other industry that combines so many kinds of science and engineering as does the motion picture industry. For that reason, it is particularly interesting to us who are interested in education, especially in science and engineering, because it means that your organization has more contacts with ours, and ours with yours, than any other society or industry.

I suppose your work fundamentally is based on applied optics, so that you have the physicist specializing in that field, perhaps, at the background of the whole work. But then there are innumerable others that you know as well as I do, and your roster of the Society would, of course, point all of these out. You have the electrical engineer who is interested in communication, and the mechanical engineer who has to assist in the design of your complicated machinery. You have the chemical engineer, the photochemist, interested in problems of the film. Physical optics comes in, because there are so many developments that involve things other than the geometrical optics, of the optical systems, in the operation of your film, color effects, and so forth. Then you have in the design of your theaters the architect, and the heating and ventilating engineer, and so on.

I could go on for quite a while, listing the various types of engineering, and when finished, I should have run through the entire list of mechanized branches of engineering. One thing is particularly interesting and that, as always, has to do with newer developments. With the introduction of sound and color into the motion picture, you have tapped some fields which have quite recently and very rapidly been developed.

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As a result of these cogitations, I cannot help thinking about what might be done and what ought to be done by our educational institutions in making some kind of effective contribution to the development of this field. This is a thing which is sure to come. I am sure that there are a number of different feasible ways in which your Society and our scientific and engineering schools would be mutually helpful.

If I have any excuse for speaking to you, except to bear the greetings and welcome from local institutions, it is perhaps because nearly twenty years ago I became particularly interested in the development of some of the scientific aspects of things that have recently become of very important use to your Society. I believe I am right in saying that it was my doctor's thesis which gave the first reasonably good experimental proof of Einstein's famous equation for the photoelectric effect, work which several years later was carried on with fine precision by Dr. Milliken, and in his hands led to an accurate determination of that famous physical constant known as Planck's constant. At that time I was associated with O. W. Richardson, under whom I was working. Richardson, a year or two ago, was given the Nobel prize for his developments in the field of emission of electricity from hot bodies, that field which underlies the modern thermionic amplifier. And in some work of eighteen years ago, we discovered the relationship between photoelectric emission and thermionic emission to this extent: we discovered what was the property of the metal which jointly determined the properties of the metal for photoelectric emission and thermionic emission. So there we have those two things which are really at the base of the application of sound in modern movies—the two things that make it possible to translate sound into light, light into sound—the photoelectric eye and the thermionic amplifier.

I have just one other thought. I mention this with some diffidence because I may be entirely wrong and may be maligning a great industry. But I had the opportunity for the first time last summer to visit some of the studios in Hollywood. I must confess that the first impression, to an outsider who has a somewhat disciplined mind and who likes things to go systematically, was that the work was carried on with what might be called a maximum degree of disorganization. I don't know whether that is due to the artistic temperaments that have to be dealt with in those productions, or even whether it is true. It may be that experience in the studios has proved that the particular way in which they do the work is the way which leads to the best

results. If so, my remarks have no point at all. But I did have it intimated to me from several sides that with the introduction of sound technic into the movies, and particularly the bringing in of engineers to coördinate and synchronize the activities in connection with shooting a picture, there was being introduced a considerable advance in what might be called the systematic organization of the process of shooting a picture.

I know there are many more important things for you to do than to listen to words of welcome. I want to repeat again the very cordial welcome from the local institutions. I am glad to see on your program that for tomorrow afternoon you have provided time for inspection trips to Harvard, M. I. T., and other institutions which are very much interested in your work. It is a particularly convenient time for you to visit our institution, because it happens that tomorrow morning it is to be inspected by a group of business executives who are visiting various research laboratories under the auspices of the National Research Council. We will, so to speak, be dressed up for the occasion. In concluding, President Crabtree, I want to reiterate the hearty welcome of these institutions to your Society.