Note: After the delivery of the papers on the Television Forum, Moderator Hyndman called for discussion. As this issue of the Journal goes to press, the paper by Richard Blount, "Studio Lighting for Television," and that by Edmund A. Bertram, "Motion Picture Laboratory Practice for Television," are not yet available, but it is expected that they will be published in later issues.

Discussion

Mr. Rockmore: Mr. Gudebrod mentioned the amount which the advertiser can afford to pay. Should not the comparative effectiveness of television versus other media be considered in considering price?

Mr. G. D. Gudebrod: I think I indicated we suspect from an advertising standpoint that it is going to be worth more to reach any given thousand people in television than by any other medium. Currently, however, I do not believe there is enough qualitative information of that kind to say what that factor is, whether it is $1\frac{1}{2}\times$ or $2\times$ or $3\times$. As the medium grows up a little, I think we shall have more concrete figures so we can say instead of, as an advertiser will say, $6.00 a thousand, maybe we shall say he should pay $10.00 a thousand. As yet we have not gone far along the road.

Dr. Alfred N. Goldsmith: We have some data on sponsor identification and product identification ratios as compared, for example, to those for standard radio, and the like, and we are beginning to get adequate data. And they do indicate a distinct superiority in impact value of television.

Mr. E. F. Zatorsky: This is directed specifically to the Technical Committee. When are they going to set up specifications on the television apertures and the like so we shall not be penalized the same as we are in standard motion picture aperture so far as the microphone goes, in order to make motion pictures cheaper for television, which would be the answer to Mr. Gudebrod's specification.

Moderator D. E. Hyndman: Unfortunately, there is no direct answer at present but work on standards is in process.

Mr. Zatorsky: Do you not think the Technical Committee ought to set up a recommendation?

Moderator Hyndman: It has been discussed, and I believe that would be in the hands of the Committee on Television. John Maurer, Engineering Vice-President, is here; perhaps he will choose to answer.

Mr. John A. Maurer: I should like to point out that in the booklet on films for television which was issued a short time ago by our Television Committee, and which has by now been rather widely circulated, there is specific mention made of the ratio of the motion picture frame that is to be expected to be utilized by the television picture. At the moment, I do not remember just what the figure is, but it is in there in quite a specific form. It has not as yet received the sanction of a standard, but doubtless it will work that way in the future.

I should like to add a couple of footnotes to some of what Dr. Goldsmith said and likewise to Mr. Hyndman's remarks with reference to the projection here.

Dr. Goldsmith made the comment that as television improves, and when a

wider frequency range may be transmitted to the television tube that is being photographed for transcription purposes, the time might arise when it would be desirable to go to 35-mm film for the negative, at least in order to get better definition. The footnote I should like to add is that at the present time in practice the lenses that are being used for this type of work by no means exhaust the resolution capabilities of the 16-mm film that is being used, and there are lenses available commercially at the present time from several manufacturers which would permit coming very much closer to the limits of the resolution. That they are not placed in service, I presume, is just one of the inevitable examples of technological lag that occur when many people are busy doing a job and do not have too much time to spend thinking about improving their apparatus.

With reference to projection lenses, a similar situation exists, on what I believe to be reliable information, that in the majority of projectors which are used to throw the image on the film into the kinescope for broadcasting, the lens is the same lens that normally is supplied in the amateur trade, which is far from exhausting the detail possibilities of the picture, and here I will be specific. Lenses which will do that job are commercially available from at least two reputable manufacturers, Bausch and Lomb and Kollmorgen, and the fact that they are not put into use for the projectors in the television stations is one of those things that requires a little explanation.

Likewise, with respect to our projection here, I think that it is unfortunate we cannot have a lens of that type on the projector used for the Society; however, I should like to make this comment about the film that we saw. From long experience of the idiosyncrasies of 16-mm films, it looked pretty obvious to me that the titles which were spliced into that reel were not on the same stock as the individual scenes, and the curl of the film in the gate was not the same; also that the projectionist was focusing on the title, and the picture was actually out of focus. It certainly was not doing justice to what was on the film.

MR. W. H. OFFENHAUSER: Recently we have seen some advertising of some of the newer receivers. The little Hallicrafter 7-inch tube receiver that has a tricky type of masking on it is one. I do not know what the rest of it may be, except I would rather expect it would limit the picture area to something like 40 or 50 per cent of the normal standard area. Has there been any trend as far as television receiver production is concerned, to guide that or limit it to meet the suggestions that have been placed in the SMPE booklet?

DR. DEANE R. WHITE: It is on the agenda for our committee during the meeting. The question whether we should take it up has been subjected to some discussion by the officers of the Society, because it was not at all certain it was an engineering problem as much as it was a commercial problem. I do not know what action the Television Committee will take because it is fairly obvious if you are going to use them on television and throw them away on peculiar masking and receivers, things will not fit, but there are certain commercial aspects of the problem entirely separate from the engineering. I would not attempt to predict how they would fit into the picture. We can certainly enter into the engineering aspect and find out what is wrong and find out what has occurred and whether or not we can change them or exchange them.

MR. PAUL J. LARSEN: I agree with Dr. White to a degree but not completely. I believe that it is an engineering organization's responsibility to at least

establish standards by which the industry can be guided. As an example, when the 16-mm film is in question, we should establish an aperture size that should be adopted by the broadcasters, and likewise establish a standard as to what the aspect ratio of the picture should be. If someone wishes to change that, then he is not abiding by standards adopted.

MR. R. M. MORRIS: I should just like to throw in for consideration the fact that the same problem of aspect ratio exists with respect to our nonrecorded presentations in broadcasting just as much as it appears in the matter of the presentation of recorded picture transmission. The aspect ratio of 4 × 3 is set by the Federal Communications Commission regulations at the present time, and unless it is approached from that standpoint, I do not know that it is a matter especially for an SMPE or any other engineering society standardization. It has been considered by the Commission, and unless there is good reason to change, I suspect that that is one of the things that we can consider fairly well established.

The matter of masking shape, I think we all considered was more or less well established until two or three manufacturers, apparently for commercial reasons, chose to try to make the receiving tube more efficient in its utilization of area rather than making the system efficient from the utilization of bandwidth, and I think it is obviously something which some organization is going to have to make recommendations on to the end that there be a standard receiving picture mask established. It is a thing in which the broadcasters, of course, are as much interested as anyone else.

MR. EDWARD P. SUTHERLAND: I have seen many motion pictures via television, and it was only recently that I noticed the Lucky Strike series. It is my personal opinion that the picture and sound quality are about the best, and I was wondering if Mr. Gudebrod or anyone else here could tell me first of all whether it is a projection print of 35-mm or 16-mm and also what the gamma is.

MR. GUDEBROD: I am not enough of an engineer to tell you what the gamma is. The network is fed by 35-mm print, 16-mm prints being made available for all nonconnected stations.

We have had as I indicated, some considerable argument about the contrast range or gamma of the prints which we are using. We have finally prevailed upon the producer and some of the engineers on the West Coast to reduce the contrast more in keeping with what we think, by rule of thumb, is right for television transmission. About the first six or eight films of the series were pretty harsh. We got edge flare. We got halation. We had troubles with it. The later ones in the series we think we got pretty well corrected. We have seen them on closed circuit, but that, of course, is an ideal situation. It varies considerably when you get it actually on the air.

DR. NORWOOD L. SIMMONS, JR.: I should like to add to Mr. Gudebrod's answer regarding the series of productions which were made by Grant-Realm Productions for the Lucky Strike show. These pictures were produced in Hollywood and the 35-mm negatives were developed to a gamma value of 0.65 to 0.70. The 35-mm prints were made on regular release positive film, developed to a gamma of about 2.40, until recently. Then an experimental print was made on fine-grain master positive film, developed to a gamma of about 1.40. The printing density used for the low-contrast master positives is light, not as would be used for ordinary motion picture duplicates, but rather in the nature of those shown by Mr. Bertram.

Mr. Moderator, I should like to ask Mr. Blount if the visual luminosity curve he showed was based on equal energies or on tungsten at 3000 degrees Kelvin.

MR. RICHARD BLOUNT: Equal energies.

DR. SIMMONS: Is it not then true that the visual-luminosity curve, in order to be fairly compared with the product curve of the tube sensitivity multiplied by the light-source-output curve, should also be multiplied by the relative output curve for the particular light source being considered?

MR. BLOUNT: In both cases, to be highly accurate we should have used fluorescent lamp or the 3000. I do not feel that for the basis of this presentation that degree of accuracy is warranted.

MODERATOR HYNDMAN: Dr. Simmons, do you not think that there has been confusion here this afternoon, with some in the television industry and some in the motion picture industry continually talking about controlling contrasts by controlling gamma, when we think of gamma as applying to a development factor only? Literally the problem is, in the majority of motion picture films produced, there is a brightness latitude greater than the television system or chain is capable of accommodating. For illustration, a latitude brightness range of 1 to 40 in a motion picture film may be common, and the television system has about 1 to 20, then television-image distortion of tone occurs regardless of gamma or density.

DR. SIMMONS: I quite agree with you. I was extremely interested in Mr. Bertram's samples and should like to congratulate him on an excellent set of tests and to tell him that had we had such a set of tests in Hollywood at any time in the last six months, it would have straightened out a great many people. I am thinking of the nontechnical people involved in making these films for television, and we have tried to straighten them out without the aid of such tests. This was a very illuminating test to me.

I think it is important, though, to point out that, at least as I saw it, the 1.70-5302 print appeared less "contrasty" on the screen than the 1.25 fine-grain master positive which is because we are dealing with toe portions of the characteristic curve. If we consider that the fine-grain master positive has a steeper and shorter toe than regular release positive film, then, in consequence, the true contrast of the screen image is not in proportion to the gamma values as read.

Therefore, it behooves us to consider the curve shape. I may be deviating somewhat from your question, but I did want to mention that in Hollywood the National Broadcasting Company and others have given thought to that matter of curve shape. That is cutting it rather fine possibly, but since there is less toe on the fine-grain film, therefore, we have more high-light contrast relative to middle tone and high-density contrast. Some people think that helps. Personally, I do not think the art or science of television has advanced far enough to allow us to see any difference yet, and I agree with you, Mr. Hyndman, in saying that at the present time the contrast of the print provided is of secondary importance.

MR. EDMUND A. BERTRAM: To answer Dr. Simmons' question or agreeing with him, it is too bad I do not have time to make a slide of the curve characteristics, but I do have all the characteristic curves of the particular films shown in the 35-mm form. The print at gamma 1.70 is made on a high-contrast film, and printed on 5302, developed in negative developer in which we tried to develop a shadow density well up on the curve to produce transparencies in the black and at the same time bring up the toe.