COMMITTEE REPORTS

REPORT OF CAMERA COMMITTEE

YOUR Committee has had for consideration but one question of standardization, since the last Fall meeting at Buffalo: this had to do with the proposal for standardizing the dimensions of the core for negative raw stock.

The principal dimensions which were recommended are as follows:

Outside Diameter: 1 29/32";
Spindle Hole: 21/64";
Slot: ½";
Flat on core Outside Diameter, at center: 1 7/8".

The matter was referred to, and is now in the hands of the Standards Committee, for investigation and action.

Proposed Standardizing of Speed Markings of Photographic Lenses:

Because of the difficulties which have been experienced in the past in obtaining uniformity of results in the use of present-day "F" values indicated on the principal makes of photographic lenses, a communication was addressed to the Bureau of Standards, Washington, D.C., calling attention to existing irregularities and suggesting that the Department assign someone to the task of studying the matter for the purpose of evolving some standard.

Some of the irregularities pointed out were:

(1) None of the lens makers in this or foreign countries have adopted uniform values corresponding with the "F" number used; that is, no two lenses of the same focal length will furnish the same efficiency at a given diaphragm opening;

(2) The above is true even of any two lenses made by the same manufacturer;

(3) It is also true that no uniformity exists in the values indicated on lenses of various foci; for example: a 50 m/m lens working at F-5.6 seldom produces the same efficiency of a 75 m/m lens working at the same speed—with light conditions and other factors being equal for the test.

A reply, received from Mr. F. C. Brown, Acting Director, is suggestive of co-operation which might be anticipated from the Bureau. In part his letter reads:

"2. As you know, the efficiency of a photographic lens in transmitting light to the film depends upon at least three factors. The F-number, the amount of light lost by reflection at the various surfaces, and the loss of light by absorption. Of these three, the first is generally considered to be the most significant. The

absorption of the lens, however, probably cannot be ignored and certainly cannot be neglected if the balsam used in cementing the elements has not been carefully bleached since the slightest yellow color robs the light of a great deal of its actinic power. It is suspected that in cases not only has one neglected the effects of absorption and reflection but lenses have been marketed which were erroneously marked as regards F-number.

3. In view of this, it is believed to be well worth while that a study be made of some of the principal lenses in order to determine their actual efficiency in transmitting the light to the film.

4. We thank you for calling our attention to this matter and wish to feel free to call upon you for suggestions as the work progresses."

It is possible that the foregoing matter might properly be referred at this time to our Standards Committee, for further action, or to the Optics Committee, for co-operation with the Bureau of Standards. The problem is manifestly not one for the Camera Committee, which is interested only in the results which the lenses furnish.

J. H. McNABB, *Chairman*

REPORT OF THE COMMITTEE ON FILMS AND EMULSIONS

THE board of Governors on December 9th, 1921, submitted to this Committee several items upon which they desired us to investigate and report.

The investigations called for are:

First: Report on inflammable and non-inflammable film stock.

Second: Methods of preparing and cutting film.

Third: Possibility of standardizing the printing of motion picture film.

Fourth: Effect of different wave lengths of light on various emulsions.

Fifth: Storage and preservation of negative.

Sixth: Investigations of different color processes.

In some respects this line of work would require an appropriation and the establishment of a research laboratory. That, of course, is not possible at this time and we are, therefore, dependent upon manufacturing companies in this field to voluntarily make the investigations. If the particular firms are interested in these subjects they will, of course, permit their experts to spend the requisite time and money. It seems, however, that the best we can hope to do, for the moment, is simply gather together available data and collate it as it is distributed.

Inflammable and Non-inflammable Film Stock

The inflammable stock is usually spoken of as nitrate base, while the non-inflammable stock is usually spoken of as acetate base.

Cost: Present cost to consumers of positive film of domestic manufacture, 1 3/8″ wide, having a cellulose nitrate base, is 2¼c per foot, unperforated.

Acetate cellulose positive of domestic manufacture, 1 3/8″ wide, is 3c net per foot, unperforated.

Acetate cellulose positive of domestic manufacture, 1 1/10″ wide, is 2½ c per foot, perforated (Eastman perforation).

Durability: Under similar conditions of use, acetate positive film has approximately 85-90%, the physical properties of the nitrate base being positive.

Shrinkage: At the time of printing, the wetting of the two bases shows that the acetate base shrinks or expands more readily than the nitrate, but in practice this has not caused any difficulty in the handling of the material.

Ability to take Dyes: In practice the base is very seldom dyed. It is assumed that the Board here intended to refer to the emulsion. The emulsion on either stock is the same and its ability to be handled for color work is the same in either case.

Transparency: Approximately the same. Any difference would be slightly in favor of the nitrate base.

Possibility of Standardizing the Printing of Motion Picture Film

Mr. Story of the Optics Committee wrote a letter to the Chairman on January 7th on this subject, which letter was copied and sent to the Members of the Committee.

Mr. A. B. Hitchins and Mr. W. R. Rothacker both wrote that they would take up the investigation of this line of work, Mr. Rothacker stating that he would have Mr. Aller of their California laboratory work directly with Mr. Story. Mr. Hitchins met the Chairman in New York on February 7th, at which time he said that he had heard from Mr. Story and would take the matter up directly with him. On April 6th Dr. Story wrote as follows:

"The only work that has been done, as far as I know, is a paper read before the Allied Film Laboratories Association on this subject, in an effort to interest them sufficiently to make some experiments on their own account, either individually or as a society. As far as I have heard, this has not been done up to the present."

Both Mr. Blair and the writer, however, feel that the efforts in this direction will not be productive of any immediate commercial advantage. It would seem that it would first be necessary to standardize the theatres of the world and, that we know, is almost an impossibility. We can take an average screen illumination and determine the type of positive, that would be suitable for the greatest number of a committee, arbitrarily set that density as a standard and then urge theatres to provide screen illumination suitable for that type of positive. The human element is an important factor again at that stage, for what will suit one, will not suit another.

Mr. Rothacker submitted a paper on April 29th from which the following is summarized:

"Literal density standardization of all prints finding their way on to the theatre screens probably never will become a fact.

"To standardize the density of positive films and to bring about a uniform result on the screen it is not only necessary to standardize density in the laboratory. Of vital importance is the element of projection. As a matter of fact, even if the density of the print were regulated to a mathematical 100% perfection, all of the beneficial results obtained through careful laboratory work would be lost in the projection booth, unless we have standardized projection to back up standardized print density.

"So, to summarize, while a great stride toward standardization of print density can be made directly through the laboratory, yet the fact remains that proper standardization is dependent upon the strength of the chain between the Eastman Kodak Company and the eyes of the audience, which chain is comprised of these links: raw stock, negative exposure, negative developing, proper printing, proper exchange processing, proper projection with standardized throw, light and screen—and, after all, a chain is no stronger than its weakest link."

No formal action has been taken by the Committee and nothing further will be done, unless there is a call for it.

Storage and Preservation of Negatives

The Motion Picture News of February 18th, 1922, asks the following two questions:

First: Can negative be preserved for future generations and is it being preserved?

Second: How long can negative be preserved so that prints can be made from it?

Mr. Blair of this Committee has prepared a paper on this subject which was read to you yesterday. Information of this sort is of greatest importance.

The British Journal of Photography, February 17th, 1922, refers to the fact that

"The first photographs deserving the name, that is to say, the first images of outdoor scenes obtained by means of a camera fitted with a lens, and of a degree of permanency such that subsequent action of light did not affect them, are certainly the images on metal, glass and paper rendered sensitive with bitumen of Judae which were obtained by J. Nice'phore Nie'pce in the years 1822-1824, subsequent to Nie'pce's earlier experiments in the reproduction of engravings. Following the suggestion made some months ago by the "Revue Francaise de Photographie," the French Photographic Society, in conjunction with the various professional associations, has formed a committee for the commemoration of the centenary of this discovery, and has fixed the year 1924 as the most appropriate time for the celebration."

The Chambre Syndicale Francaise de la Cine'matographie, has recently taken the initiative towards the establishment of a museum of cinematography. The French museum, however, is interested in the preservation of machinery and equipment.

The writer some time ago thought the idea of preserving examples of plates and films used in both colors, black and white cinematography would prove of future value, not only to our Society but to future generations. We, accordingly, have written various members of our organizations and we are promised various specimens.

I have here the first step in this direction and the earliest cinematographic films that I have are several of the Biograph films made in 1896. I will not attempt to list even this beginning of the collection, as already it is taking on quite some proportions.

Mr. John Powrie, who has been co-worker with Miss Warner for many years, is preparing a collection for the Smithsonian Institute and he is using his best efforts to have Miss Warner prepare us a collection.

Have heard from Mr. Ives and he will undoubtedly supply us with samples of work, other than those which I already have.

Mr. Murphy of this Committee is preparing some of the very earliest standard width motion picture films and he has agreed to add to the collection.

From the opening paragraph of this communication you will note that 1924 is the one hundredth anniversary of the first photograph made with a lens, while the first cinematographic films are

probably not over thirty years old. The industry, even as a whole, is not so very old and it seems to be a good time to begin gathering together specimens which otherwise will be lost. These specimens are mounted in books which is not really the very best manner of preservation, in order to determine the life of films and plates. It would prove valuable if films of 1895-96 vintage were thoroughly washed, placed in a hermetically sealed box and stored away. The reels should be filed away separately, so that only one need be opened at a time, say over a period of 50 to 100 years each, so that those opening the box at that time would know that the film they opened was in good condition and that the others would be also and could be left sealed for another 50 to 100 years. In that way, our grandchildren can determine whether the films that they are making can be successfully preserved for the future.

Color Processes

It did not seem necessary to delve into this subject for this session, inasmuch as Mr. W. F. Little, Chairman of the Committee on Progress, has been gathering data of this sort and we have communicated to him such information as we had.

WM. V. D. KELLEY, *Chairman*

REPORT OF THE NOMENCLATURE COMMITTEE

THE report of the Nomenclature Committee consisted in calling the attention of the meeting to the report as it appeared in the Buffalo Transactions and on motion duly made, seconded and passed, the definitions appearing on page 162 of the Buffalo Transactions were, with the exception of that applying to the word "projector," added to the approved list of Nomenclature.

The recommendation of the Nomenclature Committee which appears under the title "Special Report Nomenclature Committee" in the Transactions of the Buffalo meeting was considered, and on motion was laid on the table for later consideration.

C. FRANCIS JENKINS,
Chairman, Nomenclature Committee

MOTION PICTURE NOMENCLATURE

Society of Motion Picture Engineers

Definitions adopted by the Society of Motion Picture Engineers at its Boston, Massachusetts meeting, May 1-4, 1922:

EQUIVALENT FOCAL LENGTH—The equivalent focal length of a combination of lenses is equal to the focal length of a simple thin lens which will give an image of a distant object of the same size as does the combination lenses.

LANTERN PICTURE—A still picture projected on the screen by a stereopticon.

LANTERN SLIDE (Stereo Slide)—A transparent picture for projection by a stereopticon.

RETAKE—A second photograph of a scene.

SPLIT REEL—A reel of film of two (or more) parts, the subject of each part unrelated to the subject of the other part.

By action of the Society the following definitions were proposed for consideration:

MOTION PICTURE PROJECTOR—A device for suitable projecting motion pictures.

PROJECTIONIST—The man who projects motion pictures professionally.

REPORT OF COMMITTEE ON PROGRESS

THE Chairman of the Committee on Progress of the Society of Motion Picture Engineers, desires to take this opportunity to present before the Society a summary of the progress during the past six months as reported through members of this Committee who are Chairman of the Standard Committees. This report is presented with a feeling of apology as to its meager contents. The Chairman would say, however, that many new and interesting developments have been confidentially reported from time to time under the stipulation that such data must under no consideration be placed in a report. In other words, the only information available to this Committee seems to be that which has been previously broadcasted through other mediums. If this feature is clearly understood the apology should be more courteously accepted.

In answer to a communication addressed to Mr. Will H. Hays, President of the Motion Picture Distributors and Producers of America, Inc., the following statements were received.

MOTION PICTURE PRODUCERS AND DISTRIBUTORS OF AMERICA, INC.

By Will H. Hays

"The motion picture industry accepts the challenge in the demand of the American public for the highest quality of art and interest in its entertainment.

"The industry accepts the challenge in the demand of the American youth that its pictures shall give to them the right kind of entertainment and instruction.

"We accept the challenge in the demand of the American mother that the entertainment and amusement of that youth be worthy of their value as the most potent factor in the country's future.

"By our opportunities our responsibilities are measured. From him to whom much is given, much is required. The potentialities of the motion picture as a source of amusement, which is necessary, and a moral influence and educational factor are limitless.

"If this is so, and it is undeniable, then just as that opportunity is great, so in like measure is the responsibility. That responsibility is accepted. Our Association is dedicated to the aid of the industry in the discharge of these obligations. It is a task that commands the best efforts of every one.

"With an appreciation of this industry's importance in the business world and a full knowledge of its own great future, yet in that spirit of humility which recognizes difficulties and limitations,

this Association takes up its work in the confidence born of the knowledge of its own earnest purpose, and with the conviction that we will have the sympathy and co-operation of all those connected in any way with the industry itself and the co-operation and sympathy of the public, whose servant the industry is."

Engineering Data

A Bulletin[1] has just been issued by the Engineering Department of the National Lamp Works of the General Electric Company covering motion picture projection with Mazda lamps. This Bulletin is a very complete treatise on the principles of projection, properties of component elements such as light source, mirrors, lenses, aperture, shutter, screen, etc., illumination of the auditorium, incandescent lamp projection equipment, etc.

A Bulletin[2] has been issued by the Edison Lamp Works of the General Electric Company covering projection by incandescent lamps. This Bulletin is a complete treatise on the motion picture projection by incandescent lamps covering such items as advantages of projection with incandescent lamps, a comparison of the incandescent and arc lamps, a description and explanation of the optical train, focusing attachments, converters, method of focusing, discussion of screens with other engineering data.

Publicity

The Publicity Committee reports that through the kindness of several of the Trade Papers, they have received considerable publicity for the Society and that meetings have been held with the Laboratories Association on Standardization of Film Densities under Laboratory procedure. A meeting is proposed with the Motion Picture Directors Association and the Association of Cinematographers in regard to problems covering photography in the motion picture industry. Mr. Kroesen has requested Mr. W. H. Haddock, Secretary of the Motion Picture Association, to have the Association send a representative to our Convention. Mr. Colin M. Williamson of this Society and member of the Publicity Committee is conferring with the City of Birmingham, England, on several points in regard to motion picture projection. The Publicity Committee also reports that our transactions are finding many uses as a basis from which the City of Birmingham makes standards.

Propaganda has been successfully submitted to the following Societies for the standardization of their product.

Association of Film Laboratories
Motion Picture Theatre Owners Association
Motion Picture Directors Association

Up to the present time we have gone so far as to get our standardization Committee in touch with the Association of Film Laboratories of the United States with the idea in view of standardizing film densities at some future date. Dr. Wm. E. Story of the Re-

[1] Bulletin 33-A, March 15th, 1922, Motion Picture Projection of Mazda Lamps, by H. H. Madgsick and C. E. Egeler.

[2] Bulletin LD107-A, March, 1922, The Edison Mazda Lamp for Motion Picture Projection, by J. A. Summers.

search Laboratory, General Electric Company and Chairman of the Standardization Committee, gave a very interesting talk to the owners and operators of the Laboratories at a banquet the other day at Hotel Astor and aroused their enthusiasm very much on the subject of standardization.

Committee on Patents

The new Lambert bill has been passed in Washington, giving us about two hundred more examiners, at a slight increase in salaries, and raising the filing fees to Twenty Dollars. Propaganda has been started to increase the salaries of the employees of the Patent Office to a much higher degree, so that efficient men can be retained. The present bill is in no way adequate and will result only in taking young men who will surely resign and take positions which are open at a much higher salary and thus we will have inefficiency again in the Patent Office.

Standards

The Committee on Standards reports that consideration is being given to the size of lens barrels, also this Committee has endeavored to interest Film Laboratories in the standardization of density in printing motion picture films and to this end a Paper was read before the Allied Film Laboratories Association. This Paper will probably be printed in the Motion Picture World and is to appear in the American Cinematographer.

Camera

A camera has been devised by the Prisma Company which takes two identical pictures simultaneously. Mechanical features of advantage in color photography are also incorporated in the camera. The new features are designed to give all the exposures possible and steadiness in the negative records.

Pocket Movie Machine

A new pocket-clock work movie[3] has been developed and manufactured in France called the "SEPT," consisting of a small camera with clock work attachment for the movement of the film. The camera can be held in the hand and can be operated without the use of a tripod or crank. Fifteen feet of standard film can be exposed without reloading. The camera is equipped with the daylight loading attachment. This camera will take either a single instantaneous exposure, a time exposure or a motion picture. By pressing a button the entire fifteen feet of film will be run off in standard time. It weighs about four pounds, measuring five inches by 2¾ inches by four inches, the lens operating at F 3.5 and costs about $225. The revolving shutter is not variable but fixed at approximately 1/40 of a second exposure, therefore the light control is entirely at the lens diaphragm.

Another pocket camera has been placed upon the market in which 25 feet of film is available without reloading. It is thought

[3] Abstract of new pocket-clock work movie, American Cinematographer, April, 1922.

that this camera may prove of considerable value in gathering news pictures in such places where tripods are not feasible.[4]

Continuous Movement Camera and Projector

Work on the continuous movement motion picture film through motion picture machines has of late shown considerable progress.

In the motion picture machine a running film has been translated into a fixed picture on the screen and this machine is now being prepared for production.

A high speed camera involving this principle of continuous motion has been perfected in which pictures were made this summer at the rate of 1600 exposures per second. Orders have been placed for machines of this character for the solution of problems requiring high speed cinematography.

It is reported that the successful solution of the continuous motion picture problem means safe and practical motion pictures for the home. This apparatus consists of pictures arranged peripherally on a plurality of lithographed paper discs fastened together in the center. A 12-inch record 9/16 inch thick containing the equivalent of 1000 feet of standard motion picture film, the picture on the record being the same size as standard motion picture frames. This machine also is being put in shape for volume production. The machine itself resembles a Victrola and the pictures produced are about four feet wide.

This same principle is also being used as a direct-reading ground speed meter by the United States Navy.

Progress has also been made by Mr. Jenkins in the development of prismatic ring camera projector. This principle is being used in a Stroboscope for direct vision view of rapidly moving objects. By the use of a proper speedometer attachment it is possible to give a direct reading of the speed of the object examined.

The discs are also being used in the development of mechanism for the transmission of pictures by radio, ultimately motion pictures.[5]

Film

A new fireproof film[6] has been reported as an invention by Gustav Schaff, a Berlin Engineer. Ordinary celluloid films are put through a process of impregnation which renders them absolutely uninflammable. Fire makes them melt but they do not burn. An experiment reported shows a fifty-foot reel of film thrown into an open fire and left there for a certain time with only a few inches melted, the rest remaining intact. The experiments have shown that the impregnated films were no different from the ordinary films in other respects.

Emulsion

New high speed emulsion film has been placed on the market by the Eastman Kodak Company which the Committee hopes will be described in detail by Mr. Blair.[7]

[4] Communicated by A. F. Victor.

[5] All of the above in reference to continuous movement cameras and projectors supplied by C. Francis Jenkins.

[6] New York Herald Bureau, Berlin, March 4th, 1922.

[7] Suggested by A. F. Victor.

A high speed panchromatic emulsion giving a 100 per cent more exposure has just been developed. This, in connection with a camera developed by the Prisma Company, makes it possible to photograph interiors by artificial light or exteriors on cloudy days.

Color Motion Pictures

Eastman Kodachrome Process—Capstaff's Process—A typical two-color subtractive process is that worked out by J. G. Capstaff in the Research Laboratory of the Eastman Kodak Company. In order to apply this to motion-picture work, the negatives are taken in a camera in such a way that red and green pictures are taken successively, one below the other. From this strip of negative film, a master positive is made, and this is then printed by means of a special projection printer upon opposite sides of double-coated film. In this projection printer, the red positive is projected onto one side of the film and simultaneously the green picture onto the other, the images being slightly displaced vertically so that they exactly register one on top of the other on opposite sides of the film. The emulsions being exactly the same and the light intensities the same, there is no difficulty in obtaining equal results in the two pictures, and the strip is then developed and fixed for the two pictures, and without further delay is passed into the bleach bath, which bleaches the silver and locally hardens the gelatine where the silver was present. The silver is then fixed out, leaving a clear coated gelatine strip of film bearing the images in the form of hardened gelatine on both sides. The two sides are then dyed by passing through a dyeing machine, the side containing the pictures taken through the red filter being dyed blue-green and that through the green filter, red. On viewing the film so prepared, a two-color subtractive picture is seen, which, being on standard film, can be run in any machine in the same way as black and white.[8]

Colored Photo-Drama—The first complete photo-drama, using colors in positive (The Glorious Adventure) has been produced by the Prizma Company in London and was presented in March. It first appeared in New York in April.

Many new reels of colored films have recently been produced. More than 300 miles of colored positive are now running regularly in theatres in this country and England. These make up two complete photoplays in colors, five feature travel stories and many selected subjects of educational value for use by colleges, schools, etc.

Techni Color—An exhibit of Techni color was made in New York recently, but no disclosure of the technical problems involved was given out.

Talking Pictures

Radio Talking Pictures—A system of radio talking pictures is reported consisting of an arrangement whereby the films throughout the different cities are synchronized with a central Radio Station in which the actors accompany the master film in a broad-casting

[8] Dr. C. E. Mees, Photo-Miniature, July, 1921.

station. By the use of loud speaking 'phones the pictures at the theatres are accompanied by the actor's voice. This system was invented by Harry J. Powers, Jr., connected with the Erlanger Theatre interests with headquarters at the Colonial Theatre, Chicago.[9]

Cinemaphone

An apparatus consisting of a home motion picture projector with translucent screen 16 by 22 inches, has recently been developed. This cabinet much resembles the modern cabinet phonograph. Connected in the same cabinet is a phonograph attachment for musical accompaniments; apparently no effort is made to synchronize the music with the action.[10]

Films That Talk

New Swedish pictures have been developed by Mr. Bergland and recently demonstrated. The method of reproducing the sound is by focusing the light from a narrow source upon the film, allowing the light which penetrates the film to fall upon the Selenium cell connected with a battery and telephone receiver. It is usually necessary to amplify the telephone currents by means of the Thermionic valves.[11]

Objective

Much progress has been made of late on the No. 2 objective for use with the 900-watt Mazda projection lamp. With the new units screen definition is obtainable comparable with the best results previously secured with the higher grade No. 1 lenses.

Carbon Arcs

High Intensity Arcs—Recent developments in this line include the elimination of the radiating head which has been replaced by asbestos plates which act as guides for the carbons also as thermos and electrical insulators. The electrodes are provided with two contacts operating on the sides of the carbons. In this arrangement there is no possibility of serious corrosion on the contact faces and the slight movement permitted makes them almost self-cleaning. In this method plated carbons are used and introduce the current through the clamp. Lamps so manufactured have been in successful use in a number of the theatres several months. All new lamps are now so equipped.

The standard ratings up to the present time have been 75 amperes, using 11 mm. carbons; the new lamps 50 amperes, 9 mm. carbons and 100 amperes with 13.6 mm. carbons.

This high intensity arc principle has also been applied to large studio lights operating at 150 amperes and studio spot lights operating at 50, 75, 120 and 150 amperes. Other minor improvements have been made to prevent mirror breakage, increase rigidity and strength

[9] American Cinematographer, April 1st, 1922.
[10] Los Angeles Times, October 16, 1921.
[11] Science and Invention, Literary Digest, December 23, 1921.

and in general make the lamps more adaptable to the latest requirements of studio technique.[12]

Report of Present Standard Carbon Trims for High Intensity Projection Arcs

This report to be submitted at the May meeting of the Society of Motion Picture Engineers by the Progress Committee will cover only the carbon developments and present standard trims used for high intensity arc projection.

For the new model General Electric Company's high intensity projection arc the following trims have become the recognized standard in the motion picture projection field.

Columbia Positive Carbon Sizes	*Lamp Amperage Rating Direct Current*	*Point of Highest Efficiency*	*Current Operating*	
			Min.	*Range, Max.*
13.6 m/m×18″ Cored	100 Amps.	110-120 Amps.	96 Amps.	120 Amps.
11 m/m×18″ Cored	75 Amps.	75- 80 Amps.	70 Amps.	85 Amps.
9 m/m×18″ Cored	50 Amps.	50- 55 Amps.	45 Amps.	60 Amps.

The negative carbon used with the above tabulated Columbia flame cored positives are as follows:

7/16 × 9″ Columbia Cored special silvertip to be used with the 13/6 m/m cored positive with a current operating range from 95-120 amperes.

3/8 × 9″ Columbia cored silvertip to be used with the 11 m/m cored positive with current operating range from 70-85 amperes.

11/32 × 9″ Columbia cored silvertip to be used with a 9 m/m cored positive with a current operating range from 45/60 amperes.

The point of highest efficiency from a screen illumination viewpoint is obtained by operating the proper combinations within approximately 5 amperes of the maximum current recommended for the lamp in use.

To operate the present designed G. E. high intensity projection arc lamps at varying amperages it is necessary to change the carbon diameters to maintain the highest efficiency. To attempt to operate these lamps with a greater current variation than the maximum or minimum for the carbon sizes as tabulated in this report would mean a great sacrifice in efficiency and give very unsatisfactory results from a projection standpoint.

In order to use the different size carbon combination for varying amperages for the G. E. lamp it is necessary to change the positive and negative carbon clamps, the positive carbon contact shoes, and the positive and negative asbestos baffle plates. The manufacturer of this lamp advises these parts can easily be changed by the projectionist in charge of equipment, and with the exception of the changeable parts mentioned the balance of the G. E. high intensity

[12] Presented by A. D. Cameron.

projection arc lamp is identical for amperages ranging from 45-120 direct current.

The Simplex Sun-Light Arc high intensity projection lamp operates successfully with the following standard carbon:

Combination Lamp Amperage Rating Direct Current	*Columbia Positive Carbon Size*	*Columbia Negative Size Silvertips*
85-120 Amps.	13.6 m/m×18" Cored	3/8×6" Cored Silvertips
75- 85 Amps.	11 m/m×18" Cored	11/32×6" Cored Silvertips

The best operating results and highest efficiency with the 13.6 m/m cored positive and 3/8 × 6 cored silvertip negative in the Simplex Sun-Light Arc lamp is obtained when operating lamp at from 105–110 amperes direct current.

While the 75-ampere Simplex Sun-Light high intensity lamp has just recently been made a commercial proposition there is no question but what this lamp will operate at its highest efficiency with the 11 m/m trim recommended, when using in neighborhood of 80 amperes direct current. The carbon question for these lamps has passed the experimental stage in America. The National Carbon Company, Inc., through their engineers and research staff have perfected and developed the combinations submitted in this report, which have been accepted as standard trims by the General Electric Company, and Sun-Light Arc Corp. makers of the present marketed high intensity projection arc lamps.

New Projection Lamps

A new projection lamp has been developed for 110 to 120 volt service, 250-watt in a T-14 bulb and placed on the market April 1st. This now gives a range available in tubular bulbs from 250 to 1000 watts for standard lighting circuits. In these bulbs are incorporated the latest features of design including the use of the small bulb and the employment of the monoplane filament construction, which latter is also used in the 28 to 32-volt, 300 to 900-watt sizes, and the 110-120 volt lamps of 400 watts and below.

Motion Picture Screens

The Multi-Power Screen is made by indenting the surface of highly polished metal sheets. The indentations or "elements" are shallow, of mathematical curvature and degree, and uniformly distributed over the surface. The function of each element is to reflect the minute spot of picture light received upon it to a viewing area of given shape and size, the effect of the screen as a whole being equivalent to the combined effect of all the elements. The principle is analagous to that of a searchlight in that the intensity of the reflected light is governable by varying the angles of curvature—hence the dispersion of the element. Surfaces provided with 10 to 120 elements per sq. in. and of a brightness 6 to 50 times that of plaster have been produced; these were, however, built for outdoor advertising work and are unsuited for close viewing. A machine now nearing

completion will, it is hoped, produce dies for a surface having 1000 ellipsoidal elements per sq. in. with a normal brilliance 20 times that of white plaster, the light being toned down at the sides of the viewing angle. On account of the fineness of grain, this surface should appear smooth at a distance of six ft. and sharply delineate the projected picture.[13]

Trans-Lux Screen

A new system employing the rear projection and the use of the Trans-Lux screen has been brought into existence and had several exhibitions in New York. It is not conclusively proven that this system of projection is destined to become a large factor in the development of motion pictures, it being still too early to demonstrate whether a completely lighted auditorium is a sufficiently important advantage to off-set the complete change required when pictures are projected in this manner. The disadvantage of this system is a short focus lens or the necessity of lengthening the throw by the use of mirrors, as suggested by Mr. A. F. Victor. A demonstration of this method was made in the Eltinge Theatre in New York City several months ago.

Synchronous Converter

A new synchronous converter for use with 900-watt Mazda lamps has just been developed. The apparatus converts D. C. into A. C. With the converter is used a conventional A. C. regulator with manual-control. The overall efficiency of the converter and regulator is about 72 per cent. The initial cost is somewhat higher than for a rheostat but the saving in power bills is sufficiently great to off-set the expense in the first six months of operation. The converter is wound to deliver two-phase, 25-cycle to an alternating current regulator and is capable of operating two 900-watt lamps connected in multiple, one on each phase. It is compound wound and has an efficiency of about 76 per cent. The saving in energy with this device is from two to five kw. depending upon the circuit used.[14]

Switchboards

Progress has been made of late in the construction of dead front switchboards for use in studios. The switchboards are composed of the standard dead front switches which cannot be opened except when the switch is in the off position, thus eliminating the possibility of persons accidentally coming in contact with live parts.

[13] Contributed by Mr. Paul L. Clark.
[14] Contributed by Mr. C. A. B. Halvorson.

REPORT OF RECIPROCAL RELATIONS COMMITTEE

NO INDUSTRY is more international in its scope than that of the motion picture. The motion picture invading every known corner of the earth speaks a universal language and is understood by all. A picture made at Hollywood finds appreciation and understanding in the polar regions as well as the South Sea Islands.

Film and apparatus are manufactured in most countries possessing any degree of industrial enterprise, and the product is almost invariably exported due to the economic necessity of larger circulation than is offered by home consumption only.

A projector made in New York meets a reel of film made in Paris, and in order that the product from the two cities may work harmoniously when they meet in Shanghai, Samarkand or Damascus, they must fit or, in other words, be standardized.

Even before the Society of Motion Picture Engineers began its work, a fairly accurate degree of standardization had been attained. Such a standardization had been secured, however, only after a great deal of lost effort to many manufacturers who did not make apparatus or film in accordance with the measurements ultimately adopted.

Loss of time and money was the penalty of a method, based on the survival of the strong. A repetition of such automatic selection of methods has become unnecessary, since organizations for the purpose of standardization exist.

New apparatus entering the projection room, laboratory, or studio, may now be standardized from their inception and former mistakes may be avoided.

The Society of Motion Picture Engineers has become recognized as an authority on these matters, and its findings and recommendations are closely followed by the trade.

The United States is not, however, the only country concerned in this matter. Since the industry is world wide, adoption of standards must also be world wide.

It is the task of the Reciprocal Relations Committee to establish contact with and bring into relation with our own, societies formed in other countries.

* * * * * * * *

England

An association formed for purposes similar to the Society of Motion Picture Engineers now exists in London, known as The Incorporated Association of Kinematograph Manufacturers, Ltd., with headquarters at 167-169 Wardour Street, London, W.

The subject of standard of dimensions for cinematograph film was first discussed by this association as far back as February, 1907. At

that time it was found, on comparing perforations of films of different makers, that there was small but important differences, and with the object of ensuing uniformity in film dimensions, certain measurements which had been found in accordance with average practice were submitted to the members, and were generally adopted. For some time past it had been felt by the manufacturers of apparatus that the time was ripe for the adoption of a more comprehensive and definite standard than had formerly been the case.

On December 17, 1919, a meeting was called for the purpose of discussing the matter, when Mr. Arthur Newman gave an address on the subject and demonstrated by means of lantern slides the wide differences existing between certain makes of films.

At that meeting, which was attended by all the British manufacturers (or their representatives) of Kinematograph apparatus, it was unanimously decided that the question of kinematograph standards should receive more detailed consideration, and a Standards Sub-Committee was set up to deal with the matter.

The Report and Recommendations of the Sub-Committee were submitted at a general meeting of the Association held on October 12, 1920, and were unanimously adopted.

The preceding has been practically copied from the preface of the booklet "Standard Measurements," which also contain the following statement:

"The Sub-committee has also been in correspondence with the Society of Motion Picture Engineers, of the U. S. A., and have considered very carefully the transactions of that Society, covering the last four years. It is hoped that the standards herein submitted may in course of time become the standards throughout the world, so that no matter what make of film or projector may be used, they will be interchangeable in every country where the Kinematograph is used either for the educational or social welfare of its people.

"(Signed) J. BROOKE WILKINSON, *Sec'y*"

The Chairman of your Committee recommends to the Committee on Standardization a careful perusal of the booklet "Standard Measurements"; especially in view of the fact that some measurements adopted by the Incorporated Association of Kinematograph Manufacturers differ slightly from those adopted by our own Society.

Steps should be taken to immediately remove all possible differences. In many cases the measurements differ so slightly that tolerances permitted in manufacture will cover the slight variations, so that for all practical purposes the differences will not prove a hardship.

Germany

A society with headquarters in Berlin, under the name of the "Deutsche Kinotechnische Gesellschaft," has been formed for the purpose of promoting the progress of matters relating to kinematography.

Your Committee does not, as yet, know whether standards have been formulated by this society, but is obtaining this inform-

ation and will undoubtedly be able to submit a complete report at our next meeting.

Sweden

A Swedish Society—Svenska Kinematografiska Sallekapet—with headquarters in Stockholm is, at the present time, receiving the Transactions of the Society of Motion Picture Engineers and correspondence has been established with the organization through Mrs. Dagmar Waldner, Librarian of the Society.

The Swedish Society is not engaged in standardization, but is chiefly interested in the application of motion pictures to educational purposes. It has, however, a unique feature which other societies would do well to copy.

It has, as far as your chairman knows, the only library dealing exclusively with motion pictures. The credit for having brought this library into existence is due to the efforts of Mrs. Waldner.

France

No data has been secured which may be reported at this meeting, but your Committee hopes to have some information to offer shortly.

Your Committee has the following recommendations to offer:

1. That an exchange membership be created whereby the chairman of the Reciprocal Relations Committee be permitted to exchange membership in other societies for membership in our own. Such memberships to other societies should become part of the chairmanship of the Reciprocal Relations Committee so that successive chairmen may automatically become members of other societies when changes are made in chairmanship.
2. That booklets be printed in several languages, containing the standards and recommended practice adopted by our Society, as well as giving the purposes of our organization. Possibly a Book of Standards, which should be issued by us, could be translated for this purpose.
3. The establishment of a library of books and periodicals on all matters pertaining to the motion picture industry. The feasibility of such a library depends upon the problem of securing a place for such books and periodicals where members of the Society as well as the general public may be able to obtain data and information. There is, as far as we know, no such library existing in this country, and its need has frequently been demonstrated to your chairman while he acted as Secretary of the Society. It is possible that some library at present in New York may be willing to house and furnish the facilities for a collection of material. Such publications and printed matter as are now secured through the Reciprocal Relations Committee would be entirely wasted if not in some manner put at the disposal of all members of the Society.

A. F. VICTOR, *Chairman*

REPORT OF THE SAFETY COMMITTEE

ALMOST decided step to lessen the danger of fire from the use of inflammable film on portable projectors is the introduction of heat resisting or heat reflecting glass into the light beam. In the case of non-inflammable film, while there is no fire hazard, the use of one of these substances lessens the danger of injury to the film if it is stopped on the picture. In some machines, the glass is being used as a fire shutter while in others it is a permanent installation.

There are advantages and disadvantages of both methods.

1. *Permanent Installation*

Where the glass is put in so as to cut the light beam at all times, the danger of the film burning at the aperture is eliminated. The disadvantage of this, however, is that the amount of light from a given illuminant is also somewhat reduced. The percentage of reduction varies greatly. The manufacture of either heat resisting or heat reflecting glass for this purpose is a new developement and the product of various manufacturers or even of the same manufacturer at different times is not uniform.

2. *Incorporated with the fire shutter.*

The use of one of these substances in the fire shutter has the advantage of not cutting down the screen illumination while the machine is in operation but, of course, has no advantage over the metal shutter in preventing ignition at the aperture.

3. An advantage of either method of introduction of either type of glass is that it makes possible the stopping of the film and the showing of a satisfactory still picture.

The committee would suggest that some time in the not distant future, say at the next meeting, a paper on this subject be given to the Society as we feel that the matter will shortly develop sufficiently so as to warrant a much fuller discussion than can be given in this brief report.

The committee has had two meetings previous to the meeting of the Society and several matters have been discussed but the consensus of opinion was that the matters were outside of the jurisdiction of the Society or else had not been sufficiently developed to warrant a report of this meeting.

L. E. DAVIDSON, *Chairman*

REPORT OF COMMITTEE ON STANDARDS

THE work of the Committee on Standards has fallen chiefly along six lines, which are reported below. Of these the first has been regarded as being within the province of the Committee on Standards alone. In the other five lines the Committee has referred the matter to the Committee or Committees especially interested, and with a request for recommendations. This has been done from no desire to avoid either labor or responsibility, but because it was thought that the specialists composing the various committees would be able to give far better suggestions, each in his own line, than any single committee covering the entire field.

I. Proposed Changes in the Report on Standards Appearing in the Transactions of May, 1920

As was brought out at the last meeting, a special committee of the American Engineering Standards Committee, composed largely of members of our Society, met last September to consider the adoption of the standards of the Society of the Motion Picture Engineers by the American Engineering Standards Committee. These standards were presented in the form appearing in the Montreal transactions. After considerable discussion the whole matter was referred back to this Society for reconsideration, with the suggestion that the form in which the standards were presented should be changed, so as to separate standards purely dimensional, from recommended practice. It was also suggested that definitions be omitted from the list. The Standards Committee drew up a form which seemed to comply with these requirements, and sent this to our president, with the suggestion that he have copies sent to each member of the Society, in order that each might have an opportunity to mature and formulate his ideas on this important matter before discussion at this meeting. Unfortunately, this work was finished but a short time ago.

The Committee on Standards, then, presents to the Society the five following propositions:

A. Following the suggestion of the Engineering Standards Committee, it is proposed that the report be divided into two parts as follows:[1]

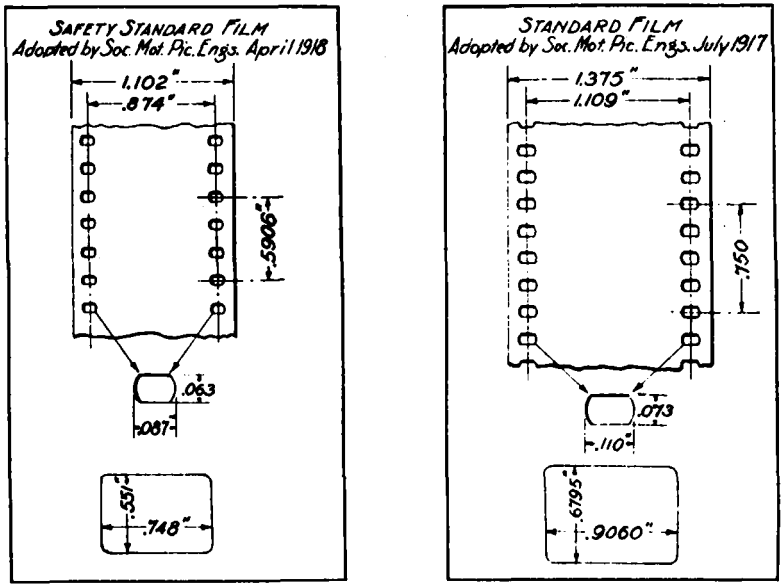
(a) *Dimensional Standards*

(1) Lantern slide mat opening. Three (3) inches wide by two and one quarter (2¼) inches high.

(2) Perforated motion in picture film (See cut). Standard Safety

[1] The dimensions are the same as those already adopted, the changes being in arrangement only.

(a)	Width	1.375 inch	1.102 inch
(b)	Width between centers of sprocket holes	1.109 "[2]	.874 "
(c)	Number of sprocket holes per foot of film	64[3]	61 "
(d)	Sprocket holes on the two sides of the film shall be directly opposite each other		
(e)	Each sprocket hole shall be that part of a circle contained between two cords of equal length perpendicular to the length of the film		
	Diameter of circle	.110 "	.087 "
	Distance between cords	.073 "[4]	.063 "



[2] The Incorporated Association of Kinematograph Manufacturers (London) has adopted as standard 1.110 inch for this dimension.
[3] The English standard is 64 holes for each 11 15/16 of film length.
[4] The English standard is .072 inch.

(3) Motion picture aperture.
(a) Standard film. Ninety hundred and sixty ten-thousandths (.9060) of an inch wide by sixty-seven hundred and ninety-five ten-thousandths (.6795) of an inch high.
(4) Frame line
(a) Standard film. The frame line shall be half way between two successive perforations on each side of the film.
(b) Safety standard film. Frame line shall pass thru the center of a perforation on each side of the film.

(b) *Recommended Practice*
(1) Projection angle. Should not exceed twelve (12) degrees.
(2) Projection lens mounting. Should be such that light from all parts of the aperture shall have an uninterrupted path to the entire surface of the lens.
(3) Projection Lens Focal Length. Tolerance not to exceed one per cent of that indicated.
(4) Take-Up Pull. Should not exceed fifteen (15) ounces at the periphery of a ten inch reel, or sixteen (16) ounces on an eleven inch reel.
(5) Thumb Mark. The thumb mark on a lantern slide should be located in the lower left hand corner next the reader, when the slide is held so that it can be read normally against a light.

B. It is proposed that the following terms be referred to the Nomenclature Committee as being merely definitions.
(1) Intermittent Gear Ratio
(2) Lantern Strip

C. It is proposed that the following terms be at present omitted for the reasons noted.
(1) Projection Lens Foci—
(a) Wrong use of word "foci."
(b) No lower limit set.
(c) Standardization will not affect manufacture in any way.
(2) Reel
(a) Objection has been raised to these dimensions.
(b) One of the dimensions given is never used in practice.
(3) Projection Lens Opening
(a) Word "opening" too vague.
(b) The lens barrel is the thing for which a standard diameter would be beneficial.
(4) Leaders and Trailers
(a) Transparent colored trailers are not in use, nor are they desirable. (See substitution offered in E below.)

(5) Projection Lens Height. Projection angle not specified.[5]

D. It is proposed that the following term be added under Dimensional Standards, Motion Picture Aperture:

(1) Safety Standard Film. Seven hundred and forty-eight thousandths (.748) of an inch wide by five hundred and fifty-one thousandths (.551) of an inch high.

E. It is proposed that the following recommendation be substituted under Recommended Practice for that appearing in the previous transactions.

(2) Leaders and Trailers. Shall be opaque (may be colored as well) with markings embossed in them. In a multiple reel story each trailer and the leader immediately following shall be marked with the same title.

II. Film Density

At the last meeting of the Society, the Committee was directed to investigate the question of film density. This matter was referred to the Committee on Films and Emulsions for comment. It suggested interesting the Film Laboratories and offered facilities for testing. At the instigation of the Publicity Committee a brief talk was given at a banquet of the Allied Film Laboratories Association in an effort to obtain the interest and coöperation of this branch of the industry. This talk has been sent to the Motion Picture News and to the American Cinematographer at their request, to interest other branches, if possible. At a meeting of a special committee of the Motion Picture Directors Association and the Standards Committee, the matter of film density was discussed and it is hoped that further action will be taken by this Society in the near future. The Committee on Standards would like to take this opportunity to express its appreciation of the work of the Publicity Committee in arranging for this meeting, as well as that with the Allied Film Laboratories Association.

III. Core Size

The size of the core on which raw film stock is wrapped has been brought to the attention of the Society a number of times. Letters requesting recommendation of dimensions have been sent to the Committee on Cameras, on Films and Emulsions, and on Laboratories. No definite suggestions have as yet been made, tho from copies of letters received, there is still interest in the standardizing of these cores.

IV. Reels

The Committee has called the attention of the Projection Machines Committee to the discrepancy between the reel dimensions as given in the Montreal transactions, and those in universal use. This was pointed out in the report of the Special Committee of the American Engineering Standards Committee. The Projection Machines Committee has this matter still under consideration.

[5] Not considered by Committee at its meeting.

V. Lens Barrels

The matter of the standardization of the external diameters of lens barrels has been referred to the Projection Machines Committee and to the Optics Committee. The Optics Committee has recommended two and one thirty-second (2 1/32) of an inch for number 1 projection lens, and two and twenty-five thirty-seconds (2 25/32) for a number 2 lens. Owing to the wide variation of interests, the Projection Machines Committee has as yet been unable to come to any decision. In fact, there seems but little chance of a unanimous agreement on these dimensions, tho the desirability of such an agreement is universally admitted.

VI. Notching Distance

This dimension, once so urgently brought before the Society for standardization, has been temporarily laid on the table pending patent settlements.

W. E. STORY, JR., *Chairman*

Action of the Society on the Report of the Committee on Standards

The various items in the report of the Committee on Standards were taken up individually and discussed at length. A vote was then taken on each item to decide whether the Society would officially approve or reject the recommendations of the Committee. The following list contains the items officially approved.

Dimensional Standards

(1) Frame line
   (a) Standard Film. The center of the frame line shall be half way between two successive perforations on each side of the film.
   (b) Safety Standard Film. The center of the frame line shall pass thru the center of a perforation on each side of the film.

(2) Lantern Slide Mat Opening. Three (3) inches (76.20 mm) wide by two and one quarter (2¼) inches (57.15 mm) high.

(3) Motion Picture Aperture
   (a) Standard Film. Ninety hundred and sixty ten thousandths (.9060) of an inch (23.01 mm) wide by sixty-seven hundred and ninety-five ten thousandths (.6795) of an inch (17.26 mm) high.
   (b) Safety Standard Film. Seven hundred and forty-eight thousandths (.748) of an inch (19.00 mm) wide by five hundred and fifty-one thousandths (.551) of an inch (14.00 mm) high.

(4) New Perforated Motion Picture Film (See cut).

	Standard	Safety Standard
(a) Width	1.375"(34.92 mm)	1.102"(27.99 mm)
(b) Width between centers of sprocket holes.	1.109"(28.17 mm)	.874"(22.20 mm)

(c) Distance between the centres of successive sprocket holes.	.187″	.1968″
(d) Sprocket holes on the two sides of the film shall be directly opposite each other..		
(e) Each sprocket hole shall be that part of a circle contained between two cords of equal length perpendicular to the length of the film.		
Diameter of circle	.110″(2.79 mm)	.087″(2.21 mm)
Distance between cords	.073 (1.85 mm)	.063″(1.60 mm)

Recommended Practice

(1) Thumb Mark. The thumb mark on a lantern slide should be located in the lower left hand corner next the reader, when the slide is held so that it can be read normally against a light.

(2) Projection Angle. The projection angle should not exceed 12°.

(3) Projection Lens Mounting. Should be such that light from all parts of the aperture shall have an uninterrupted path to the entire surface of the lens.

(4) Projection Lens Focal Length. Tolerance not to exceed one percent of that indicated.

(5) Leaders and Trailers. Shall be opaque with markings embossed in them. In a multiple reel story each trailer and the leader immediately following shall be marked with the same title.

REPORT OF THE THEATRE COMMITTEE

YOUR Theatre Committee has the honor to report as follows: As the committee was not appointed until March 16, 1922 there has been only sufficient time to glance over the ground the committee will presumably be expected to cover, and to select for first consideration such things as seem to have greatest need for attention.

The following is an excerpt from a letter sent by the chairman of the committee to its other members:

"May I ask that each of you suggest such things as should, in your opinion, have first attention of the committee. My own view is that attention should first be given such things as give promise of yielding quickest and best returns in beneficial results. I have myself selected the following as things meriting attention by the committee:

(a) Glare spots in theatres. I suggest this as worthy of immediate attention because such spots are very common, and they unquestionably work very serious injury to eyesight; also for the reason that such spots make the viewing of pictures unpleasant, or even painful, hence reduce the attractiveness of the motion picture theatre to the patron in so doing reducing box office receipts.

(b) Projection room location, because it has directly to do with picture distortion, distortion of the picture outline and with waste of light.

(c) Surroundings of the screen, because they have much to do with impressions received by theatre patrons, as well as with the excellence of the screen result itself.

(d) Light effects in auditorium, in which I believe we may expect to receive much aid from Mr. Samuel L. Rothafel.

(e) Physical condition of films received by theatres, which is a subject I believe the committee should give its earnest attention."

In response to this letter the members all replied, the following excerpts containing the essential things with relation to the suggestions made by the chairman.

Mr. Frank Rembusch said: "* * * I agree with you all the way through, a, b, c, d and e, but especially as to a, b and e. I will be glad to serve on the theatre committee and will be very willing to do all I can to help in the work."

Mr. P. M. Abbot wrote: "* * * I think the subjects you have suggested are good, but would like to suggest also the following for consideration:

(1) Standardization of general theatre illumination.

(2) Standardization of screen illumination.

(3) Apparent distortion of picture when viewed at extreme angle, which shows need for recommendation on sight lines.

(4) Selection of size of screen for each particular theatre."

Mr. William T. Braun wrote: "* * * In glancing over your suggestions as to subjects to be taken up by the committee, it seems to me that theatre lighting in general is about one of the most important, and under it would come glare spots, as well as the lighting effects mentioned in your letter."

Major Grierson failed to comment on the matter at all, but said "* * * Certainly I will assist in every possible way in connection with the Theatre Committee, though it will of course be impossible to attend any of its meetings in person."

Press of work in the final finish of a new book made it entirely impractical for the chairman to do anything more before the meeting. It is his intention, however, and I am sure is the intention of every member of the committee to take our work seriously and to try earnestly to accomplish those things the Society expects us to accomplish. The committee would welcome such suggestions as any member or members of the Society may wish to make, either at this meeting or by mail afterward. We hope to be able to report some real progress at the fall meeting.

F. H. RICHARDSON, *Chairman*

In Memory of

C. A. Rohr
March 27, 1922

Thomas Howard
June 10, 1922