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and coordinate system for colorimetry. Professor Hardy immediately recognized the usefulness of this information, especially when used in combination with accurate spectrophotometric data. He spent many years devising and teaching methods for facilitating the combined use of these two groups of data, for color measurement in myriad applications.

Early in his program for facilitating the application of spectrophotometry to color measurement, Professor Hardy developed the selected-ordinate method of color calculation, which eliminates almost all of the nearly one hundred multiplications per sample required in other methods. This method employs spectrophotometric data at the closest wavelength intervals in spectrum regions where they are most needed according to the standard-observer data.

The selected-ordinate method and extensive tables to facilitate color computations by both this and the older methods were presented with clear descriptions and examples in the *Handbook of Colorimetry*, prepared under his direction and published in 1936 by The Technology Press. That book also contained a monumental set of large-scale sections of the chromaticity diagram, available nowhere else, for the convenient graphical representation and analysis of the relations among colors. Consequently, the Handbook is still a standard reference work in daily use in hundred of color measurement laboratories throughout the world.

He invented and had built during 1936, as an attachment for his spectrophotometer, an automatic digital integrator that calculated the color specifications for each sample which its spectrophotometric curve was being drawn.

Professor Hardy early recognized that the 1931 recommendations of the International Commission on Illumination necessitated a revision of the report of the 1922 Colorimetry Committee of the Optical Society of America, which had established similar data for use in this country. As Vice-President of the Optical Society, he was instrumental in persuading the late Dr. Loyd A. Jones, a member of the 1922 Committee and his chief during his two years at Kodak, to accept the chairmanship of a committee appointed in 1933 to revise the original Colorimetry Report. Professor Hardy served actively on that committee for almost two decades, until the revised report was published. He played an important role, often lonely and sometimes unpopular, in bringing about the final adoption of the psychophysical and operational basis of the revised report. The report finally appeared as a book, *The Science of Color*, published by the Thomas Y. Crowell Company of New York City in 1953.

Professor Hardy served as President of the Optical Society of America from 1935 to 1937, and as Secretary from 1939 to 1957. During his period of service as Secretary, the membership of the Society almost quadrupled, from 650 to over 2400. In recognition of his distinguished work in optics and related fields, he was awarded the Frederic Ives Medal of the Optical Society of America in 1957.—Glenn E. Matthews.

section reports



The Atlanta Section met on April 11 at the Protestant Radio and Television Center with an attendance of 15. Guest speakers were Dr. Ernest Arnold, President of the Center and Carl Degan, Production Manager.

Dr. Arnold welcomed the Section to the Center and explained its work pointing out that it is a nonprofit organization, producing religious programs exclusively for radio and television. It is the largest organization and the only interdenominational one doing this type of production work.

The excellently equipped center has a staff of 31 and handles 1200 taped radio programs each week. In addition to the present 1/4-in. sound tape duplication equipment, plans are being made for the installation of facilities for originating and duplicating programs on video tape.

Mr. Degan escorted the group to the Chapel Studio where two films produced by the organization were shown. One, a 27-minute 16mm color film *The Triumphant Tradition* was of interest primarily because it demonstrated the multiple-camera technique used by Mr. Degan in his past experience in producing TV advertising films.

The other example shown was a 9-minute film strip in color with sound. This was an excellent example of the use of contemporary art to illustrate the origin of Christianity.

Following this latter presentation, there was a discussion period and a tour of the facilities of the Center.—John C. Horne, Secretary-Treasurer, 404 Page Ave., N.E., Atlanta 7, Ga.

The Atlanta Section met on May 15 at the Georgia Tech Library with an attend-

Erratum

January 1961, New York Section

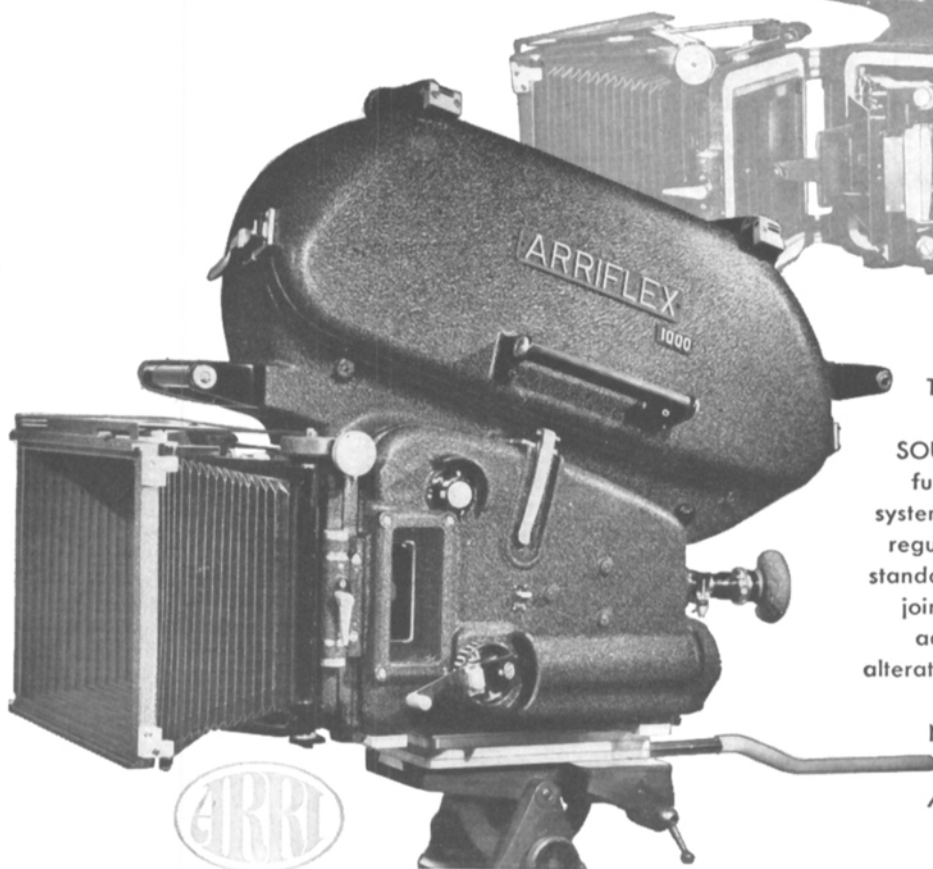
On p. 56, lines 4-10 of second paragraph:

For: "In commenting on the future of 8mm sound films, he noted that about 8,000,000 8mm projectors are now in use, as against 600,000 16mm projectors, with production running at a rate of 800,000 8mm units versus 50,000 16mm projectors per year."

Read: "In commenting on the future of 8mm sound films, he noted that by the end of 1961 there will probably be between 4 and 5 million 8mm silent projectors in use in the United States as against an estimated figure of 727,000 16mm sound projectors in use in the U.S. as of January 1, 1961. Approximately 700,000 8mm silent units are sold in the United States annually versus 40 to 50,000 16mm sound projectors per year."

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ance of 14. Marshall Cooksey, Research Engineer, Engineering Experiment Station, Georgia Institute of Technology, was the guest speaker. He discussed "Problems in Optical Instrumentation—Rocket and Missile Photography."

Mr. Cooksey gave a brief outline of the purpose and function of the Georgia Tech Research Experiment Station. In 1960 over \$5 million was spent on research at the Experiment Station. The projects were classified in three categories: (1) State sponsored; (2) private industry; (3) Federal (including research and development of military equipment).

The principle of the intermittent motion-picture camera operating at maximum speed of 400 frames/sec was pictorially compared to the rotating compensating prism camera operating in the range of 2,500 frames up to 4,000 frames/sec.

A number of film clips photographed with the Wollensak Fastax high-speed camera were shown in conjunction with a demonstration of various applications of the camera.—John C. Horne, *Secretary-Treasurer*, 404 Page St., N.E., Atlanta 7, Ga.

Dr. Walter P. Siegmund was guest speaker at the April 12 meeting of the **Boston Section**. Fifty-nine persons attended the meeting at the WBZ-TV Studios to hear Dr. Siegmund discuss, "Fiber Optics."

Dr. Siegmund presented a very interesting program, well illustrated with slides and several examples of special applications of fiber optics. A lively post-meeting discussion indicated intense interest.

Twenty members of the Optical Society of America were present at this meeting.

Dr. Siegmund and Mr. Fiddes of the American Optical Co., were guests of the Section at dinner earlier in the evening.—Lester E. Bernd, *Secretary-Treasurer*, Information Technology Labs., 10 Maguire Rd., Lexington, Mass.

The **Canadian Section** met on April 5 at the National Film Board Auditorium in Montreal with a large attendance.

The meeting began with the showing of a selected film which was followed by the presentation of a paper entitled "A Versatile Animation Camera and Stand," by Douglas M. Roberts.

A coffee break sponsored by Alex L. Clark Ltd., of Toronto, followed Mr. Robert's discussion.

Vice-President Edward Schmidt of Reeves Soundcraft, Danbury, Conn., presented a paper on the "History and Developments of Magnetic Film Striping in the U.S."

At the close of the meeting, interested persons were invited to view the equipment described by Mr. Roberts.—Harold Green, *Secretary-Treasurer*, Park Photo Supply Co., 77 Craig St. West, Montreal, P.Q.

Vice-President William Hedden of Calvin Productions, Inc., addressed the April 18 meeting of the **Chicago Section** at the St. Clair Hotel. Eighty persons were present to hear Mr. Hedden's discussion of "16mm Camera and Release Print Stocks."

The speaker's talk dealt with the use of various types of film for use in 16mm cameras and release prints. A 16mm film was shown which compared printing results,

all taken from a Commercial Ektachrome original, on Kodachrome Reversal print stock, color negative-positive print stock, and black-and-white Ortho, Pan, and TV release film.

A second comparison was shown illustrating results on 5269 Duplicating stock from a Commercial Ektachrome original and Kodachrome Type II original.

A third film illustrated the effects, timing and color corrections on color printing. A fourth film was shown which compared various black-and-white prints including reversal as well as negative-positive printing. The audience was thus able to judge the merits and effectiveness of the various types of printing stocks and techniques used.

During the afternoon, a Board of Managers' meeting was held at the Behrend Cine Corp. offices followed by dinner at Tracey's Restaurant.—Philip E. Smith, *Secretary-Treasurer*, Kodak Processing Lab., 1712 Prairie Ave., Chicago 16.

The Chicago Section met on May 16 at the St. Clair Hotel with an attendance of 80. Dr. Walter P. Siegmund, Assistant Director of Research, American Optical Co., was the guest speaker. His subject was "Fiber Optics."

During his discussion of the theory of transmission of light by glass fibers, Dr. Siegmund used slides to illustrate the practical applications of fiber optics in the transmission of light and the modification, dissection, scrambling and reconstruction of images transmitted through a fiber optics system. A few of the many applications of fiber optics are found in coding work and medical photography.

Prior to the meeting, there was a brief Board of Managers' conference, followed by dinner. A coffee break was held following Dr. Siegmund's presentation.—Philip E. Smith, *Secretary-Treasurer*, Kodak Processing Lab., 1712 Prairie Ave., Chicago 16.

The Hollywood Section met on May 16 at the Metro-Goldwyn-Mayer Theatre with an attendance of 285. Guest speakers were Walter Beyer, Cordova, Inc.; Eric House, Technicolor Corp.; G. M. Sprague, MGM Sound Dept.; and John Waner, Eastman Kodak Co.

MGM Studios generously provided a meeting place and facilities for the meeting which was opened with a 16mm color documentary film prepared by North American Aviation Co. The film showed the X15 in manufacture, information on studies and research necessary both before and during actual flight.

Mr. Beyer described a new cartridge type projector and film system that facilitates the showing of a vast amount of picture information contained in a relatively small reel. Other applications such as educational and training films, double-frame projection and 3-D projection were also demonstrated and discussed.

Mr. House described the methods used by Technicolor for preparation of 8mm magnetic-sound release prints made from 35mm Eastman color negative and 16mm Ektachrome source material.

Mr. Sprague described the transfer from a magnetic master to quadruple rows of magnetic striping in the preparation and

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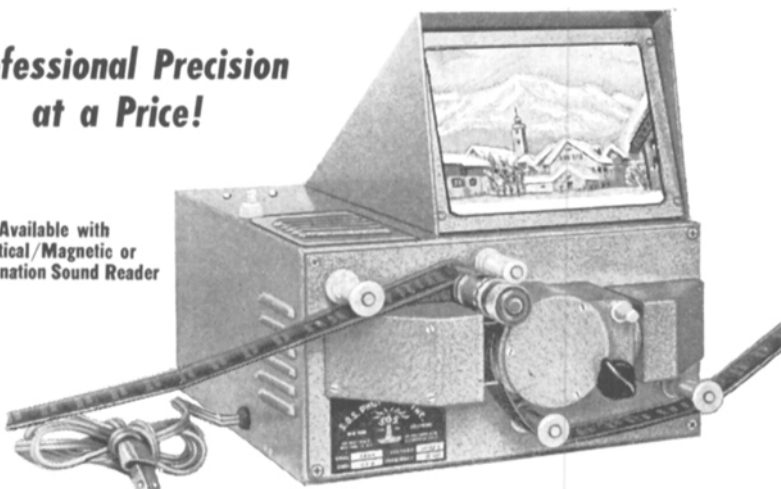
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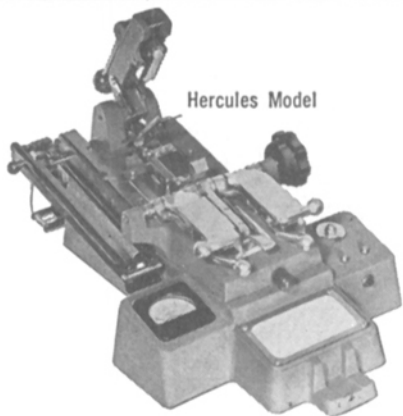
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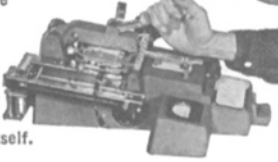
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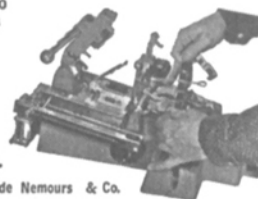
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making of 8mm magnetic-sound release prints.

Mr. Waner discussed the system used by Eastman Kodak Co. to provide 8mm Sonotrack. Quality control data from operating experience were reviewed to indicate reasonable production control for the guidance of laboratories that may wish to design similar striping systems.—John Kiel, *Secretary-Treasurer*, Photo-Sonics, Inc., 820 South Mariposa St., Burbank, Calif.

The Nashville Section met on May 20 at the Studios of WLAC-TV with an attendance of 16 members and guests. Guest speaker Jack West, Manager of the Central Division of General Film Laboratories, discussed "Video Tape-to-Film Transfers."

Mr. West's talk was concerned with the demand which has arisen for video tape-to-film transfer and the way in which his laboratory is accomplishing it. His discussion was followed by the presentation of several examples of 16mm transfers, the playback of a program on WLAC-TV's video-tape facilities and its corresponding film transfer for direct comparison.

Coffee was served, courtesy of WLAC-TV.—H. R. Briscoe, *Secretary-Treasurer*, 403 Signal View, Chattanooga 5, Tenn.

Executive Vice-President Glen G. Magnuson of the Kalvar Corp. was guest speaker at the May 17 meeting of the New York Section. One hundred ten persons attended the meeting at the World Affairs Center Auditorium to hear Mr. Magnuson discuss "The Kalvar Story."

The speaker presented a new system of photography which does not require chemical processing. The system of Kalvar entails exposure of the film to light and subsequent heating to produce a developed image. The material may be safely handled in daylight without deterioration. Kalvar is unique in that the opaque area of the film is composed of light-scattering centers rather than the light-absorbing grains of conventional photographic films. Although the opaque area appears white to the eye, it projects black on the screen.

A demonstration was made with a simple engineering drawing negative placed in contact with a sheet of Kalvar film and exposed and developed in a 300-w slide projector. The entire process took about three seconds to complete and the developed image was then projected. A further demonstration proved that the film was inert to the action of water, alcohol and carbonated beverages. A simple cleaning with a dry cloth returned the product to its original state.

Mr. Magnuson stated that the United States Bureau of Standards has assigned a shelf life of 5 years to this product. He pointed out, however, that a much longer period of life is probably more realistic. Because insufficient time has elapsed since the inception of this process, longer official shelf life times could not be assigned.

Many applications of the product were discussed including data recording by the Armed Forces, and professional motion pictures. A new company owned jointly by Kalvar and MGM has been formed to develop motion-picture techniques.

Mr. Magnuson's talk did not elaborate on technical aspects, but a question-and-

answer period provoked interest along these lines. He did mention, however, that currently they are using Mylar base and that other bases have been tried on an experimental basis. He promised to send technical manuals to those members requesting them.—William H. Metzger, *Chairman*, Ansco, 405 Lexington Ave., New York, N.Y.

Allen L. Sorem of the Applied Photography Div., Research Laboratories, Eastman Kodak Co., addressed the April 27 meeting of the Rochester Section. His subject was "The Potential Role of Photography in Space." Fifty-one persons attended the meeting at Dryden Theatre.

Mr. Sorem traced man's attempt to obtain aerial photographs from various carriers such as the pigeon, balloon, airplane and rocket. Examples of the results obtained by the use of each type of carrier were shown in slide form along with the cost on a per square mile photographed basis.

Recent developments in films enabling the user to make detailed ground photographs from high altitudes were shown as examples of improvements in film definition and resolution capabilities.

According to Mr. Sorem, "Photography has been made so easy that many people take it for granted. However," he pointed out, "photographic quality of a level that would warrant an attempt to take pictures from space vehicles will only be obtained by the most careful engineering of the complete photographic system."

The speaker's discussion showed how photographic results may be predicted in advance from laboratory data and aerial tests.

The film *This is Color* preceded the meeting.

A group of members met at the Treadway Inn before the meeting where Mr. Sorem was our guest at dinner.—D. Lyle Conway, *Secretary-Treasurer*, Maple Hill Farm, R.D.2, West Monroe, N.Y.

The Washington Section met on April 17 at the National Academy of Sciences Auditorium with an attendance of 35. Guest speakers were: Arthur L. Foster, Chief, Film Processing Laboratory, U.S. Dept. of Agriculture, whose subject was "Quality Control in Film Processing"; and John H. Roe, Manager, TV Camera Engineering, Broadcast and Television Equipment Div., RCA, who discussed "New Camera Tubes and Cameras."

Mr. Foster's paper was based on the SMPTE book, "Control Techniques in Film Processing." The set of slides accompanying the lecture contributed to the better understanding of the subject. The Section expressed its appreciation to Mr. Foster and Walter E. Shea of Eastman Kodak Co., who handled the projection for this part of the program.

From Mr. Roe's well presented paper and the clarifying assistance of pertinent slides, the Section gained a good understanding of various models of image-orthicon picture tubes and RCA's model TK-12 television camera.

Informal discussion over refreshments furnished by John Waller of Bell & Howell Co., followed the formal presentations.—David E. Strom, *Secretary-Treasurer*, 1002 By-Pass Rd., Williamsburg, Va.