Pacific Coast Section
P. G. Caldwell, Chairman
E. W. Templin, Secretary-Treasurer
R. G. Hufford, Manager
Karl Freund, Manager
L. H. Bowman, Manager

The Annual Business Meeting of the Society on Monday, October 18, discussed and approved the proposed increases in membership fees to make them as follows:

Fellows and Active Members, $18.00
Associate Members, $12.00
Student Members (not changed), $5.00

The Board's considerations leading the Resolution for amending the Society's Bylaws were reported in the September *Journal*.

Education, Films and TV

As described in the August 1953 *Journal*, the **Rochester Institute of Technology** has for some time been working on plans to offer a degree program in its Department of Photography. These plans have now matured and beginning with the fall quarter it will be possible for students at the Institute to work toward the Bachelor of Science degree in photography. The new plan provides for the well established Associate in Applied Science degree program to be the basic educational program for the first two or three years of study. The BS program is built directly on top of the AAS plan and requires one or two additional years of study, depending upon the student's major course of study.

The second annual **American Film Assembly,** sponsored by the Film Council of America, will be held April 4–9, 1955, at the Waldorf-Astoria Hotel, New York. At the April 1954 Assembly some 360 16mm films were exhibited in 26 screening sessions, and attendance was over 1000. Climaxing the three-day affair were the Golden Reel Awards presented to the 12 films receiving the highest score in achievement of purpose in their respective categories.

The National Planning Committee of the American Film Assembly held regional meetings in Hollywood, New York and Evanston during the early summer. At these meetings and by subsequent correspondence the rules for the 1955 program were given detailed consideration. Now in the last stages of preparation, the Regulations and Procedures along with the Golden Reel Film Festival entry blanks will be in the mail by the end of September. They are also available on request from American Film Assembly, Film Council of America, 600 Davis St., Evanston, Ill. Deadline for entry in the Festival competition is January 15, 1955.

Rudy Bretz, Television Program and Production Consultant, author of several articles in this *Journal* and of the book *Techniques of Television Production* and coauthor of *The Television Program* and of *TV Scripts for Staging and Study*, has been named Production Consultant to the Alabama Educational Television Commission. The most progressive state in the union, as far as educational television is concerned, Alabama has under construction a three-station educational television network which will cover 90% of the state. The majority of this construction is financed by State funds, appropriated by the Alabama legislature. Mr. Bretz will oversee the design and construction of production facilities and take an active part in planning the programming of the network. Programming is expected to begin within the year.

Book Reviews

Television – The Electronics of Image Transmission in Color and Monochrome – 2d ed.

By V. K. Zworykin and G. A. Morton
Published (1954) by John Wiley & Sons, 440 Fourth Ave., New York, 16 ix + 1037 pp., 698 illus. 6 × 9 in. Price $17.50.

The second edition of this book has expanded as has the subject with which it deals. In the fourteen years since the first edition, color, improved camera tubes, video tape recording, industrial television and even community antenna systems have come into being and these have been treated in this revision.

Fundamental principles remain the same, however, and the authors treat these in Part 1 of the book. Semiconductors, secondary emission, phosphors and electron optics are covered from both the physical and mathematical aspects.

In Part 2 the process of image scanning, sinews of the practical television system, video pickup devices from Nipkow disk to electronic velocity modulation, and picture reproduction from the mechanical beginnings to viewing with storage tubes have been explained.

Part 3 treats in detail the important parts of the modern electronic television system. Interesting in this treatment is information on just how an iconoscope is constructed and processed. These authors should know: they were there at the birth! Numerous other pickup tubes are treated, the image-orthicon, Isocon and Vidicon, to name a few.

The kinescope is similarly treated, with fabricating details as well as necessary engineering data, and a separate treatment of the electron gun. Video amplifiers, with information on required compensations, scanning circuits and synchronization both VHF and UHF television transmitters, transmitting and receiving antennas, and the television receiver with its several kinds of circuits are all also presented.

In Part 4, three full chapters deal with color television — 168 pages. Starting with color fundamentals, the earlier simultaneous and sequential systems are described, followed by such matters as mixed-highs and a full exposition of the present NTSC-evolved now FCC-standard color system. The third color chapter details color apparatus, from camera tubes to receiver screen.

How television has been applied to monitoring industrial processes is quite fully treated, including stereo television. Television as an industry, with emphasis on television broadcasting station construction and operation and notes on networks, concludes the book.

References at the end of each chapter, an author index and a subject index increase the usefulness of the volume, which would seem to be a required reference for anyone seriously interested in television. Besides the engineer and the advanced student, to whom the book has been principally addressed, it would appear that the executive and the research worker would find information of value; the former in acquiring well-organized knowledge on the subject to the depth to which he might be able to go and the latter to insure that his particular endeavors are rightly related to the known art. Patent attorneys and agents should find the book highly useful.—*Harry R. Lubcke*, Registered Patent Agent, 2443 Creston Way, Hollywood 28, Calif.

Acoustics

By Leo L. Beranek. Published (1954) by McGraw-Hill, 330 W. 42 St., New York 36. i–x + 481 pp. Profusely illus. with drawings and graphs. 6 × 9 in. $9.00.

Dr. Beranek states that this book is the outgrowth of a course he has given to seniors and graduate students and the introduction proposes a certain order of presentation in such a course. It is not limited to this purpose, however, for the material is covered in a manner useful to those engaged in the practice of acoustical and allied work.

In the earlier chapters, concerning fundamental concepts, mathematics is necessarily used freely. The author strives to carry along a concurrent physical explanation of these phenomena to aid those (as this reviewer) who are not adept at mathematical analysis. Particular stress is laid on the use of electro-mechanico-acoustical analogies and the concept of acoustic components and circuits. Detailed comparisons of the impedance-type and mobility-type analogies are given to demonstrate the situations where each is most useful.

The instruments of acoustics—microphones and loudspeakers—are treated extensively from the standpoint of design as well as of fundamental operation. A detailed description of design methods for direct radiator loudspeaker enclosures is particularly complete. The differing characteristics of direct radiator and horn-type loudspeakers are elucidated and suitable applications for each are given. Directivity characteristics are emphasized, although no discussion of acoustic lenses is included.

Those subjects concerned more intimately with application of acoustics to human activities are elaborated in the final chapters—acoustics of rooms, meas-

urement of sound and control of noise, and a discussion of the psycho-acoustic criteria which guide the application of acoustic control methods to field situations. In these chapters, where analysis must often be supplemented or guided by empirically determined quantities, the treatment is less mathematical with many tables and graphs to aid computations.

Throughout the text, illustrative problems are proposed and worked out to demonstrate the application of the methods described. An important feature is the inclusion of 22 pages of problems to be worked by the reader, covering the material of all 13 chapters. The book is well printed for easy reading, with clear tables and figures. Tables of data required for computation are included, together with a comprehensive index. Some references are given, but there has been no attempt to make them a complete bibliography.

This book is an important and welcome addition to the literature of acoustics, and will prove useful to those interested in the application of acoustical principles or associated techniques. Perhaps this is best demonstrated by the fact that this reviewer has found frequent occasion, during the short time it has been in his possession, to consult its pages in the course of his daily work, and has found the answers he sought.—*William B. Snow*, Consulting Engineer, 1011 Georgina Ave., Santa Monica, Calif.

Books Briefly Noted

Lead Sulphite Films, 19 pp., is Vol. 4, numbered PB 111331, in a series entitled "Metallic Coatings on Non-Metallic Materials," issued by the Office of Technical Services, Rm 6227, U.S. Dept. of Commerce Bldg., Washington 25, D.C. This volume sells for $1.00, was prepared by Samuel Wein, Consultant, and is described as follows in the government's release: In addition to the various processes, discusses applications of lead sulphide films in mirrors, electrical resistance elements, planographic arts, rectifiers and detectors, and light-sensitive cells.

Silver Films, PB 111236, vol. 1 of the series is 138 pp. and sells for $2.00. All other volumes sell for $1.00. In addition to *Lead Sulphide Films* noted above, they are: *Copper Films,* PB 111237; *Nickel Films,* PB 111330; *Gold Films,* PB 111332; *Mechanical Films,* PB 111333; *Metallic Paints for Printed Electronic Circuits and Other Uses,* PB 111334; *Vacuum Coating Methods,* PB 111335; and *Applications of Metal Films on Commercial Products,* PB 111336.

Stills of interest and one in depth are these three books recently published by Morgan & Lester, 101 Park Ave., New York 17.

Graphic Graflex Photography is a new version of this well-known book which now includes among its contributors: Ralph M. Evans, Jeannette Klute, Ralph Steiner, Josef A. Schneider, Joseph Costa, Don D. Nibbelink, T. T. Holden, Rudolf Kingslake and Vernon E. Whitman. Although subtitled "The Master Book for the Larger Camera," there is much that is applicable for all still photography. In 6 × 9 in. format, its 432 pp. are profusely illustrated, including 16 pp. in color, and it sells for $6.00.

Photography with the Graflex 22, more fully explained with the subtitle "Better Pictures and More Fun With a Twin-Lens Reflex Camera," by John S. Carroll, is a slighter book but in the same format as the one above. Among the many illustrations in its 128 pp. are 9 in color. The book, being suited to its aim, naturally contains a minimum about the various aspects of photography in general. It sells for $3.00.

Stereo Realist Manual has been written by Messrs. Morgan and Lester aided by 14 stereo experts. They have produced a comprehensive coverage of the possibilities and procedures for this popular 35mm color stereo system. Within the 400 pp. are hundreds of stereo pairs, with two sections in color, to be viewed or studied with the viewer supplied with the book. The price is $6.00.

TV Factbook, now available in the Fall Edition, is a semiannual production of *Television Digest,* edited by Martin Codel. The current compilation is a book of 400 pp., available at $4.00 from Television Digest, Wyatt Bldg., Washington 5, D.C. Contents of previous editions have been listed in this *Journal.* Its wealth of data continues to be amazing in relation to television station and network facilities, licenses, construction permits, applications, discontinued operations, advertising rates, industry ownership and personnel.

What does it cost to produce and distribute a motion picture for advertising or public relations purposes? The Association of National Advertisers, 285 Madison Ave. New York, has published a new book, "*The Dollars and Sense of Business Films*," which for the first time provides heretofore confidential data on actual production, distribution costs and methods for advertising and public relations films produced by 67 of the nation's leading companies. The book sells for $5.00

Based on a survey of 157 nontheatrical films representing a total investment of $12,000,000, this 128-page book gives us the following information:

The typical company spends only 4.6 cents to obtain an average of 26 min of a viewer's time to tell the company's story.

The cost per viewer can drop to as low as 3 mills over the life of the film if a good film is made for a broad, general purpose, audience.

The average film has a long useful life — usually five years, often more.

When films are in circulation for over 10 years, the cost-per-viewer may drop to as low as ½ cent.

It's possible to produce successful nontheatrical films for $25,800, the median cost in this study.

The study shows a film can be expected to reach an audience of 276,036 in a year although audiences of up to 4,548,000 have been booked depending upon the nature of the film story and the target audiences.

Based on the work of the A.N.A. Films Steering Committee, under the chairmanship of John Flory of the Eastman Kodak Co., the book is the result of more than two years' efforts aimed at putting pertinent data in the hands of those people who are investigating the possibilities of nontheatrical motion pictures as a solution to their communications problems.

Second International Symposium on High-Speed Photography and Cinematography

The 1st International Symposium on High-Speed Photography was held in Washington in October 1952 under the auspices of the Society of Motion Picture and Television Engineers.

The 2d Symposium took place in Paris from September 22 to 28 under the sponsorship of the Association Francaise des Ingénieurs et Techniciens du Cinéma (AFITEC), with the British Kinematographic Society, the Deutsche Kinotechnische Gesellschaft and the Samtfundet Svenska Film Ingenjörer acting as cosponsors.

With nearly 200 French members and more than 100 visitors from 18 countries, the Symposium pointed up the increasing interest in photographic methods for the investigation of rapid events in the most varied branches of science and technology, from ballistics to biology, and in such fields as metallurgy, mechanical engineering, aeronautics, electricity, physics and chemistry.

The proceedings comprised 5 lectures and 66 papers distributed into 10 half-day sessions and devoted to experimental methods as well as their applications. Thirty equipment exhibits included almost all commercially available high-speed cameras.

Before reviewing briefly the various technical aspects of the Symposium, two general points may be made.

In the first place, it appears clearly that the use of short exposure-times and high taking rates is not limited to the study of very fast phenomena. The time of exposure should be such that the resulting blur is small compared to the dimension of the subject in the direction of motion. It should therefore be made smaller not only for increasing velocities, but also for decreasing sizes. Thus the study of the process of chip formation at the crystal level requires exposure-times less than 1 μsec and taking rates of about 40,000 frames/sec. A 1% blur on 10 micron droplets travelling at a velocity of only 1 m/sec requires an exposure of 0.1 μsec. Similarly rates in the range of 1,500 to 3,000 frames/sec are necessary if the blood flow is to be observed and its velocity measured.

The rather obvious fact that microscopic observation often can be combined with photography is not always familiar to potential users and should open new fields of application to high-speed techniques.

In the second place, apart from the qualitative results due to the time magnifying property of motion-picture projection, many papers showed the importance of the quantitative information derived from high-speed photographs and frame sequences. This metrologic aspect provides the instrumentation engineer with accurate specifications for image definition in time and space, and requires the development of adequate methods and instruments for record evaluation.

Flash Sources

The electrical and optical properties of electronic flashlamps were reviewed in a lecture by Prof. Laporte. A few particular aspects of gas discharges were studied by W. D. Chesterman (short discharges in xenon), Dr. E. Früngel (demountable high-pressure tubes and triggering method with short delay) and R. Aumont and R. Vodar (guided sparks in compressed gases). W. D. Chesterman emphasized the difficulties of defining flash duration, since exposure time is inseparable from the photographic operating conditions. Interesting details on the definition and measurement of spark-gap deionization time were given by K. Vollrath.

A. Stenzel and K. Vollrath have combined the use of a rotating drum with the Cranz and Schardin multiple-spark arrangement for obtaining a higher number of frames, while H. Luy and R. Schade make use of surface discharges on an electrolyte-impregnated ceramic material in order to record reflexion pictures on a rotating drum.

Special mention should be made of the cathode-ray tube flash generator presented by P. Devaux (Laboratoire Central de l'Armement). Already used by Courtney-Pratt as a light source in connection with his scanning techniques, the cathode-ray tube is now capable of producing flashes of 1 μsec or less sufficiently intense to obtain good transmission images. The high control accuracy of the flashes leads to the construction of so-called "cameras with internal chronometry" of various types, particularly cameras with image-switching by means of a rotating beam or multiple sources.

Finally the present possibilities of flash radiography and high-speed cine radiography were discussed in a paper by G. Thomer, who presented a sealed tube with a life of 1,000 flashes.

High-Speed Shutters

Prof. Karolus studied the various electro-optical effects (Kerr, Faraday and Pockels) and their application as high-speed shutters. The lower limit is of the order of 0.01 μsec for the Kerr effect.

Various shutters were described by Sultanoff, Viard, Walker, Heine-Geldern, Fünfer, and Müller in their papers on ballistic applications.

High-Speed Cameras

The time and space resolution of optical compensation cameras was discussed by R. A. Levy and K. Pfister in their papers on image kinematics and a precision spark-gap time-base. R. A. Levy recommends the use of flash illumination to minimize geometric aberrations.

J. H. Waddell announced a new Fastax 3,000 frames/sec camera with rotating-prism compensation weighing 9 lb and costing less than $1,000.

W. P. Vinten showed the features of the high-definition camera bearing his name (300 frames/sec), while W. J. Sexton examined a number of cameras used for armament and aeronautics research and stressed the need for a 16mm camera rated at 400–500 frames/sec.

E. W. Walker described a 500,000 frames/sec rotating-beam image-switching camera, the resolution of which is improved by the use of a Kerr-cell high-speed shutter. The rotating mirror of this camera is driven by a pneumatic motor described in a paper by Maj. F. H. Coates.

It is now well known that the principle of image-sampling (or scanning) cameras lies in the possibility of recording on one and the same photographic plate a number of interlaced images consisting of a pattern of lines or dots. The applications of this principle to macro- and microphotography have been studied by Dr. J. S. Courtney-Pratt, D. P. C. Thackeray and G. R. R. Bray. All cameras described make use of the lenticular selector plates made by La Reliéphotographie, Paris. Some of the methods described by Courtney-Pratt and Thackeray make use of a cathode-ray tube as a light source. These authors generally scan the camera objective, while Bray uses a focal-plane scanning method. These papers show a notable improvement in resolution as compared to previous results. The scanning methods make it possible to reach very high taking rates with simple means.

The classification of high-speed cameras was discussed by P. Naslin.

Lighting

The technical characteristics of various light sources for high-speed cinemato-