Division, for their colorful and attractive display featuring the new Bell & Howell additive color printer. The Award was received for his company by James L. Wassell.

### Convention Committees

As always, a successful convention depends on the months of hard work put in by the Convention Committees. Convention Vice-President Harry Teitelbaum conferred several times before the Convention in Chicago with the Arrangements Committee. Program Chairman Jack Behrend, Papers Committee Chairman Robert C. Rheineck, Editorial Vice-President Glenn E. Matthews, the Program Topic Chairmen and the Papers Committee Regional Chairmen are responsible for the excellence of the papers program, described below.

Arrangements Chairman Philip E. Smith and Vice-Chairman William D. Hedden did a very efficient job. For handling the fine exhibit we must thank Allen Hilliard.

Hotel Arrangements were in the competent hands of Henry Ushijima after Harry E. Paney became ill. All involved with the Convention have expressed their special appreciation for the thorough planning and co-ordinating provided by The Drake's representative, R. E. Cloutier. Hospitality Chairman John H. Maynard did a fine job of making everyone feel at home as visitors in Chicago. Membership Chairman Daniel S. Giroux obtained one of the best pro rata gains ever accomplished in a Section of the Society.

The Awards Program on Tuesday evening was staged and managed by James L. Wassell. This important Society affair was enhanced by the nicety with which it was arranged.

On the lighter side, Geo. W. Colburn is due real gratitude for entertainment activities. Luncheon Chairman Harold Kinzle and Banquet Chairman Kenneth M. Mason were responsible for the enjoyment of those affairs. Registration was handled expertly by Robert J. Yuskaitis who provided minimum delays and maximum information. Achilles Bartimoccia carried out transportation arrangements that are so necessary whenever a large group gets together.

I. F. Jacobsen was Chairman for Projection. There were many expressions of appreciation for the high-quality projection, with some formal expressions during the papers sessions. Al Wrobel and William Meissner assisted. The equipment and services were given the Society with the compliments of Clarence Jalas, Business Agent, Local 110, and Essannay Electric Co.

William Findlay and Behrend Cine Corp. gave the services and equipment for Public Address and Recording — both of major importance to a smooth running convention. Jerry Potter and Sam Irwin assisted.

Joel Willard was Publicity Chairman for the Convention. Bruce S. Odom gave substantial assistance for publicity in the early stages and Richard K. Hance was a stalwart assistant for the latter part of the week.

Auditors for the Convention were Jack Whitehead and Donald T. Balousek. Administrative Assistants were Jerome C. Diebold, Richard K. Hance, C. E. Heppberger, Henry Ushijima and James L. Wassell, all of whom were of special help at different times.

(See the Papers Program heading which follows "Society Awards" and gives the details of the papers sessions with such emendations and additions as were made after the program was printed.)

## 93rd SMPTE Convention and Equipment Exhibit

April 21–26, Traymore Hotel, Atlantic City, N. J.

PLANS FOR THE Atlantic City convention are well up to schedule. It is still too early for details on the technical program, but there are already indications that in some areas there will be papers of much more than routine interest, according to advice from the *Program Chairman*, **Henry Kozanowski,** Radio Corp. of America, Bldg. 10-3, Camden 2, N. J. Instrumentation and high-speed photography papers, for example, will cover an unusual variety of subject matter.

There are also good expectations of some outstanding papers from overseas, and particularly from Europe, in the field of television. These are being gathered by the *Associate Chairman for Papers From Abroad*, **Rodger J. Ross,** Canadian Broadcasting Corp., 354 Jarvis St., Toronto, Ont., Canada.

Authors who have not yet sent in their abstracts should note that the deadline – February 4, 1963 — for getting them to the Program Chairman or appropriate Topic Chairman is almost here. There has been one change in the list of Topic Chairmen since this was last published. *Current Trends* in Laboratory Practice will now be under the supervision of *John J. Kowalak*, Movielab, Inc., 619 West 54 St., New York 19. The other Topic Chairmen are:

*Application of Motion Pictures and Television to Education:* **O. S. Knudsen,** Alice Norton House, Iowa State University, Ames, Iowa.

*Instrumentation and High-Speed Photography:* **Morton Sultanoff,** 626 Roberts Court, Aberdeen, Md.

*New Instrumentation in Television:* **R. L. Pointer,** American Broadcasting Co., 7 West 66 St., New York 23.

*New Technology of 8mm Commercial Motion Pictures:* **C. Loren Graham,** Color Technology Dept., Eastman Kodak Park, Rochester 12, N. Y.

*Recent Motion-Picture and Television Developments in Outer Space Technology:* **H. M. Gurin,** Radio Corp. of America, Astro-Electronic Div., Box 800, Princeton, N. J.

*Short Film Subjects:* **Tom Hope,** Eastman Kodak Co., 343 State St., Rochester 4, N. Y.

The Exhibit Chairman, **Dennis E. Kealey,** has made an early start on organizing the Equipment Exhibit. His address is: Reevesound Co., Inc., 35–54 36th St., Long Island City 6, N.Y.

# Society Awards

The formal presentation of awards and honors took place on Tuesday evening, October 23. James Robertson, Vice-President for Network Affairs of the National Educational Television and Radio Center, addressed the Awards session. He said that the television viewer is as much to blame as the commercial television industry for Newton Minow's "vast wasteland," ". . .While certainly the owner of a television station has a great responsibility, so also does the owner of every television set," he said. "No matter what is transmitted, it is only what is watched that counts."

A radio announcer at the age of 15, Mr. Robertson was named program manager of WTMJ-TV in Milwaukee in 1947 and director of programming of WTTW, Chicago, in 1954. In 1959 he joined NET as director of station relations.

President John W. Servies presided over the session and James L. Wassell was responsible for arrangements.

### Honor Roll

Lloyd Thompson, outstanding pioneer in the industrial use and processing of 16mm sound film, has been selected posthumously for inscription on the Honor Roll of the Society. His is the 27th name in 46 years to be added to this list of those pioneers who made contributions of fundamental importance to the industry.

Born in Eskridge, Kansas, Mr. Thompson received a degree in Journalism from the University of Kansas in 1932. During his college years he was fascinated with photography as a hobby and became more and more interested in the possibilities of the commercial motion-picture field as a profession. Following his graduation, he became co-founder of the industrial motion-picture producing organization and laboratory now known as the Calvin Company. A firm believer in the future of the direct 16mm method of producing commercial and educational films, Lloyd Thompson headed the technical work of his company, actively seeking to improve existing 16mm equipment to meet the new, improved products and uses of materials in this field.

Mr. Thompson also believed there was a place for sound on 8mm film. He developed and marketed an 8mm film projector with the sound on a disk, and later designed and developed a sound-on-film unit using magnetic striping.

A member of SMPTE since 1934, Lloyd Thompson became a Fellow of the Society in 1951. He was always active in Society affairs, being the author of 11 *Journal* papers and a frequent speaker at conventions and Section meetings. He served as a member of the Board of Governors and was Progress Report Committee Chairman for 5 years. For his efforts with regard to the annual Progress Reports, he was presented with a special award. He was also a member of the Standards Committee and was active in the founding and work of the Association of Cinema Laboratories.

At the time of his death on December 24, 1960, Mr. Thompson was Editorial Vice-President-elect of the Society.


## Now Hunt offers you a complete control system for Cine reversal processing— with 4 one-step concentrates for remarkably simpler use, better results.

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**HUNT**

**Fred H. Perrin receives the Journal Award from President J. W. Servies.**

**Lawrence W. Davee receiving the Samuel L. Warner Memorial Award.**

## Fellows

Twelve members were elevated to the status of Fellow and were presented certificates at the awards session by Norwood L. Simmons, Chairman of the Fellow Membership Committee. The recipients were:

| | |
|---|---|
| Millard W. Baldwin, Jr. | H. Theodore Harding |
| | George T. Keene |
| Joseph T. Dougherty | John A. Leermakers |
| George T. Eaton | James A. Moses |
| Henry M. Fisher | John W. Wentworth |
| Theodore H. Fogelman | Joseph D. White |
| | Daan M. Zwick |

## Journal Award

Fred H. Perrin, research associate at Eastman Kodak Co. Research Laboratories in Rochester, N.Y., received the 1962 Journal Award for his paper, "What Is the Sensitivity of a Photographic System?" The paper was delivered at the Fifth International Congress on High-Speed Photography in 1960. It deals with each of the various factors involved in a photographic system, such as exposing equipment, light source and the light sensitive recording medium, and then analyzes each of these factors individually and as interrelated in the formation of a photographic image.

Dr. Perrin graduated from the Massachusetts Institute of Technology and obtained his doctorate from the University of Rochester. He is known especially for his work as co-author of *The Principles of Optics* (1932), and also as author or co-author of numerous papers on binocular flicker, resolving power and evaluation of image quality. Another paper of his, "Methods of Appraising Optical Systems," received an Honorable Mention in the 1960 Awards.

The Journal Award Committee, headed by John L. Forrest, also gave Honorable Mention to four other papers in the 1961 Volume of the *Journal:* "Some Philosophical Aspects of High-Speed Photography," by Morton Sultanoff; "Rapid Processing of Motion-Picture Film by the Application of Viscous Coatings," by George Cummins, Robert J. Wilson and John R. Turner; "Electronic Brightness Contouring," by Raymond L. Hallows, Jr.; and "A Fifty-Millimicrosecond Flash X-Ray System for High-Speed Radiographs," by F. J. Grundhauser, W. P. Dyke and S. D. Bennett.

## Samuel L. Warner Memorial Award

Lawrence W. Davee, President, Century Projector Corp., was presented with the Samuel L. Warner Memorial Award for his concept of a fully transistorized motion-picture theater sound system and his engineering guidance in developing and introducing such a system into many theaters throughout the world, and also for his initiative in sponsoring the design and installation of the only American-made combination 70mm-35mm projectors. The citation was read by Loren L. Ryder, Chairman of the Award Committee.

After his graduation from the University of Maine in 1922, Mr. Davee joined the Western Electric Co. as a research engineer. He advanced to the Bell Telephone Laboratories and then became recording engineer and studio manager for Fox Movietone News, where he personally recorded some of the first sound-on-film motion pictures.

Later, as studio manager of the Edison Studios for Electronic Research Products, Inc., and the World Broadcasting Corp., he worked on the development of wax flowing and plating techniques for the first high quality electronic transcriptions. He then joined the Century Projector Corp. as engineer and sales manager. Under his engineering guidance at Century, besides the specific developments which earned this Award, all the special projectors for Cinerama, Cinemiracle and horizontal VistaVision were designed and built.

## David Sarnoff Award

Pierre Mertz, formerly with Bell Telephone Laboratories, now a consulting engineer for broadband transmission problems, received the David Sarnoff Gold Medal Award for his development of a mathematical theory of scanning in television and for his studies of the effects of noise and of echoes on the quality of television pictures. The citation was read by Reid H. Ray.

Pierre Mertz was born in Paris. After graduating from Cornell in 1918 he joined the American Telephone and Telegraph Company in New York. He returned to Cornell in 1922 as an instructor in the Physics Department. In 1926 he rejoined the Department of Development and Research of the AT&T Co. and transferred to Bell Telephone Laboratories in 1934. He retired from the Laboratories in 1958 and has since been active as a consultant.

By the expression in a double Fourier series of the signal resulting from scanning, Mr. Mertz showed that it was possible to demonstrate the existence of gaps in the spectrum in which pilot and control tones or other signals might be transmitted without interference. This mathematical theory of scanning underlies the NTSC color-television transmission system. Furthermore, through the use of a scale adapted from the field of experimental psychology for the rating of the quality of television images, it became feasible to evaluate the effect of noise, echoes and other transmission irregularities on television reproduction. These data have formed the basis for international specifications for allowable transmission impairments.

Mr. Mertz has long been active in the Society's affairs. He was elected Fellow in 1948 and has been Chairman of the Society's Board of Editors since 1955.

## Herbert T. Kalmus Gold Medal Award

Paul W. Vittum, Head of the Color Photography Div., Research Laboratories, Eastman Kodak Co., received the Herbert T. Kalmus Gold Medal Award. The citation was read by Deane R. White.

Dr. Vittum has been involved in research in the field of color photography for more than 25 years. In the early years of his career he was concerned with the chemistry of dye-forming development and the study of the developers and couplers subsequently used in a number of color processes. His work and ideas contributed to the origination of the couplers and dispersion system used in Ektachrome and to the colored couplers which are used as a means of automatically correcting for absorption

# Auricon

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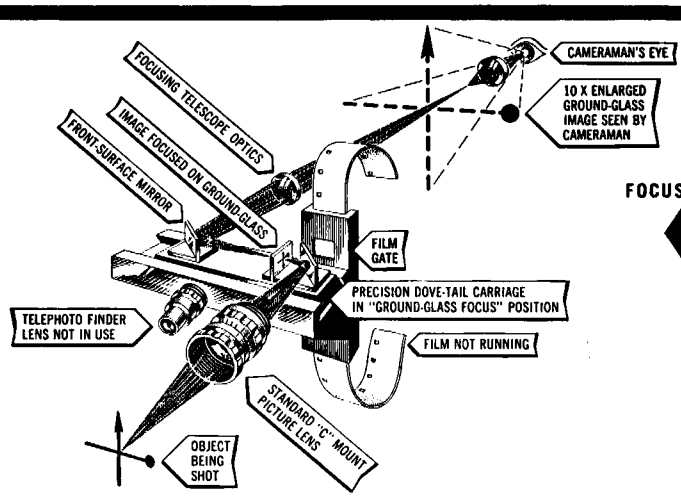
### with Full-Frame Reflex Ground-Glass FOCUSING OPTICAL SYSTEM

The unique and versatile features built into the 16mm Auricon "SUPER 1200" Sound-On-Film Recording Camera have prompted Producers and Cameramen to name the Super 1200..."Finest 16mm Sound Camera ever built!" This Camera is "Self-Blimped" for whisper-quiet Studio work, has 33 minutes of continuous film capacity, Variable-Shutter or Kinescope "TV-T" Recording Shutter, plus the combined "Rifle-Scope" Telephoto Finder and Reflex-Focusing Optical Systems illustrated below. Its only equal is another Auricon "Super 1200"...




**IN USE FOR FULL-FRAME GROUND-GLASS FOCUSING**

"Super 1200" Reflex Ground-Glass Focusing-Frame indicates the field covered by any focal-length lens at all distances. A 10X enlarged Ground-Glass image is seen by the Cameraman, for needle-sharp critical focusing.

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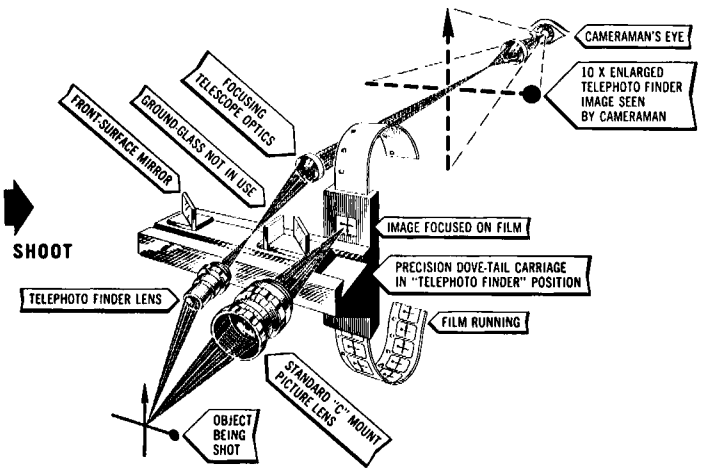


**IN USE AS TELEPHOTO-FINDER DURING FILMING**

No Camera-weight shift on tripod legs when moving from focus to film-shooting position with the "Super 1200." Camera-body does not shift to focus, or shoot film, as Optical-System Dove-Tail Carriage is only moving part!

## THE CAMERA OF TOMORROW, HERE TODAY! ITS ONLY EQUAL IS ANOTHER AURICON "SUPER 1200"

**FEATURES OF MODEL CM-74 CAMERA INCLUDE...**

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- Auricon all-transistorized "Filmagnetic" Sound-On-Film Recording System can be used with the "Super-1200" Camera (with or without Optical Sound-On-Film also installed in the Camera).
- "Super-1200" is Self-Blimped for completely quiet Studio use.
- Built-in Electric Camera Heater with automatic Thermostat-Control, provides reliable cold-weather Camera operation.
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- 600 and 1200 ft. film Magazines available. Up to 33 minutes of continuous filming.
- During picture exposure, your film runs through the Auricon "Super-1200" Film-Gate with the light-sensitive film emulsion accurately positioned on jewel-hard Sapphire Surfaces, an exclusive Bach Auricon feature (U.S. Patent No. 2,506,765). This polished Sapphire Film-Gate is guaranteed frictionless and wear-proof for in-focus and scratch-free pictures, regardless of how much film you run through the Camera!
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100 ft. Runs 2¾ min.
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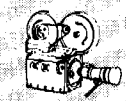
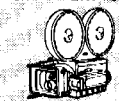
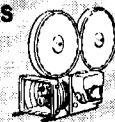


AURICON "PRO-600 SPECIAL"
400 ft. Runs 11 min.
$1295.00 & up



AURICON PRO-600
600 ft. Runs 16½ min.
$1456.25 & up



AURICON SUPER-1200
1200 ft. Runs 33 min.
$4,149.00 & up

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Pierre Mertz receiving the David Sarnoff Gold Medal Award.

Paul W. Vittum receiving the Herbert T. Kalmus Gold Medal Award.

deficiencies of the dye images used in Eastman Color Negative Films. He also played a major role in the perfection of these couplers and later in their application in the specific color films now in use.

Dr. Vittum is a native of Reinbeck, Iowa, and received an A.B. degree from Cornell College, Iowa, in 1929. In 1933 he was granted a Ph.D. degree from Cornell University, Ithaca, N.Y. After joining the Eastman Kodak Co. in 1933, he worked as a research chemist in the photographic chemistry department, where he studied fine-grain developers. In 1937 he transferred to the color research department, and in 1940 became head of the color photographic chemistry department. In 1954 he was appointed assistant head of the color photography division, associate head in 1955, and division head in 1961.

Dr. Vittum is a Fellow of this Society and also holds membership in the American Chemical Society, the Photographic Society of America and the Society of Photographic Scientists and Engineers. He is the author of numerous papers and patents dealing with the chemistry of dye-forming development and the synthesis of dyes for photography.

## E. I. du Pont Gold Medal Award

The E. I. du Pont Gold Medal Award for contributions to the art of photographic instrumentation was given to Harold E. Edgerton, Professor of Electrical Engineering at Massachusetts Institute of Technology and President, Edgerton, Germeshausen & Grier, Inc. The citation was read by Ethan M. Stifle.

Dr. Edgerton received his undergraduate training at the University of Nebraska and his Master and Doctor of Science degrees at Massachusetts Institute of Technology, where he has taught since 1926.

His contributions to the field of photographic instrumentation have been especially noteworthy in the development and application of short duration flash sources, in the founding and management of a company which supplies vital instrumentation services to the U.S. atomic weapons testing program, and in the sharing of his knowledge and experience through instruction courses for practitioners in the field.

During the past year the latter function has proved to be of great value to the advancement of the entire field of high-speed photography. The enthusiastic interest and zeal displayed by Dr. Edgerton in the organization and conduct of intensive training schools for persons working with short-duration flash equipment has resulted in a new clarity of understanding of the possibilities and limitations of this field by those sufficiently fortunate as to participate.

A Fellow of this Society, Dr. Edgerton served as Chairman of the Instrumentation and High-Speed Photography Committee and was recipient of the Society's Progress Medal in 1959.

## Progress Medal Award

For his work over a period of years in the successful development and use of the zoom lens the Progress Medal Award for 1962 was presented to Dr. Frank G. Back, President, Zoomar, Inc. The citation was read by former Progress Award winner John G. Frayne.

Dr. Back was born in Vienna and received his M.E. in 1925 and Sc.D. in 1931

Harold E. Edgerton receiving the E. I. du Pont Gold Medal Award.

Dr. Frank G. Back receiving the Progress Medal Award.

from the Technische Hochschule in that city. After graduation he was a consulting engineer in Vienna and later in Paris. Coming to the United States in 1939, he held a partnership in the Gastro Photo-Laboratories, New York, from 1939 to 1942. He then served as Chief Engineer with the Helix Gage Works, New York, from 1942 to 1944. He founded the Research and Development Laboratory in 1944 and became President of Zoomar, Inc., in 1945.

Dr. Back has received many awards including the Gold Medal Annual Award of the Television Broadcasters' Association in 1947 and the Friedrich v. Voigtlaender Gold Medal Award of the Photographic Society, Vienna, in 1960. He was made a Fellow of the Royal Photographic Society in 1949, a Fellow of the Photographic Society of America in 1952, and was President of the Society of Photographic Scientists and Engineers in 1958. Dr. Back was elected to Fellowship in SMPTE in 1961.

Dr. Back has contributed many articles to the *Journal* of the Society, the Journal of the Optical Society of America, and numerous other magazines both in this country and in Europe. He has been awarded 31 U.S. patents in the field of vari-focal and catadioptric lens design and has received 9 foreign patents in the same area. He is generally regarded as the "father" of the zoom lens and has developed it to its present wide use by practically all the television stations in this country as well as in many countries abroad. In addition, his designs are widely used in professional and amateur motion-picture production, and still photography.

**Response by Dr. Back**

## Breakthroughs

We always think of something spectacular when we talk of a breakthrough. Actually, a breakthrough can always be pinpointed to a very small but significant discovery, though it always radically changes the whole concept.

I do not want to talk in generalities, I do not want to tell you anything about the big, headline breakthroughs, such as transistors, solar batteries, and so forth. But I would like to tell you about two small unknown incidents. One of them changed the concept of our philosophy of physics, the other one broke the barrier in zoom lenses.

I had a very interesting discussion with Albert Einstein about the relation between his general theory of relativity and the special theory of relativity. One, as you know, deals with the concept of time and matter, the other deals with the concepts of gravitation, space curvature, and the principle of equivalency. The two theories of relativity seem to have nothing in common except the name "relativity." The basic mathematical concepts are completely different from each other, and I asked Einstein during one of our discussions, how he conceived the idea of the general relativity, which seems to have no connection at all with the special relativity.

He said that he had reached a dead end in his thinking, and eventually resorted to a mental experiment. He took a box of matches, drew out six matches and made a hexagon out of them. Then he took six more matches, and inserted them into the hexagon to build the spokes of a hexagon wheel. Then he started to rotate the wheel rapidly in his mind. "Well," he said, "we do know from the special theory of relativity that everything shortens its length in the direction of its movement. So, the matches on the circumference of the wheel do shorten their length. The spokes, however, which are moving perpendicular to their length, will not shorten. Actually, then, the matches on the rotating hexagon will be shorter than the spokes. But," he said, "how can that be possible? Just a moment ago I took all the matches from the same matchbox. There is only one logical explanation. The rotation of the wheel made the space curved."

This simple mental matchbox experiment was the big breakthrough from the special theory of relativity to the general theory of relativity.

When I worked on my basic concepts of zoom lenses, I hit one snag. A zoom lens has to hold its speed. It would be unbearable to have a zoom lens which, while changing its focal length, does not retain its transmission value. This means that in every zoom lens the f value has to remain constant over the entire zoom. Since the definition for f stop was and is always: "equivalent focal length/diameter of entrance pupil," and since the very nature of a zoom lens is change of equivalent focal length, the entrance pupil has to change accordingly.

All zoom lenses prior to Zoomar time had

a linkage changing the iris with the zoom position. This fact made the zoom lens mechanically cumbersome, complicated, and unpractical. I had to think of a way to get around the dependence between the equivalent focal length and the entrance pupil. When I replaced the mathematical definition *E.F.L./Den* with *L"/Dex* the variable equivalent focal length disappeared from the formula. (*E.F.L.* is equivalent focal length; *Den* is diameter of entrance pupil; *L"* is distance between exit pupil and focal plane; *Dex* is diameter of exit pupil.) Consequently, if the distance between the exit pupil and the focal plane could be made constant, the entire problem of variation in f speed would disappear. The simple solution was to place the iris diaphragm behind all movable elements of the zoom lens.

Fifteen years ago, I tried to obtain a patent on that principle of having the diaphragm placed behind the movable elements in a zoom lens. The patent examiner did not understand the significance of that breakthrough, but since then, every single zoom lens on the market today, regardless of design, whether optically compensated or mechanically compensated, has its diaphragm behind the last movable element.

## 92d Convention Papers Program

The Program's format was one of over 50 technical papers in eight sessions, two sessions of reports on the papers at the Sixth International Congress on High-Speed Photography, an extensive tour of the Argonne National Laboratory and a full session of equipment papers and demonstrations. This was prepared by Program Chairman Jack Behrend and his committee of Topic Chairman under the general direction of Editorial Vice-President Glenn E. Matthews and the Papers Chairman Robert C. Rheineck.

A major portion of the papers cited below was shown in the Advance Program published in the September *Journal* which included abstracts, when available, for all papers. A copy of the final Program is available upon request to Society headquarters.

Short film subjects shown at each session of the convention were representative productions made by Midwest producers. These were very favorably received. These were garnered by Kenneth M. Mason who contributed substantially in this way as well as many other unannounced ways to the success of the Convention.

In the story below the sessions are described as nearly as possible as they were finally arranged and held at Chicago.

*Projection Practices*

I. F. Jacobson, Topic Chairman, was assisted by Session Chairman John W. Ditamore and Session Vice-Chairman Richard E. Vuillaume at this informative Monday Morning Session. The film *Mural: Midwest Metropolis* by Fred A. Niles Productions and four papers were presented. The first paper, "Cold Mirror Lamps for 8mm Projectors," was given by John O. Geissbuhler of General Electric. Arthur E. Nupnau and Jaroslav Cherniav-