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.

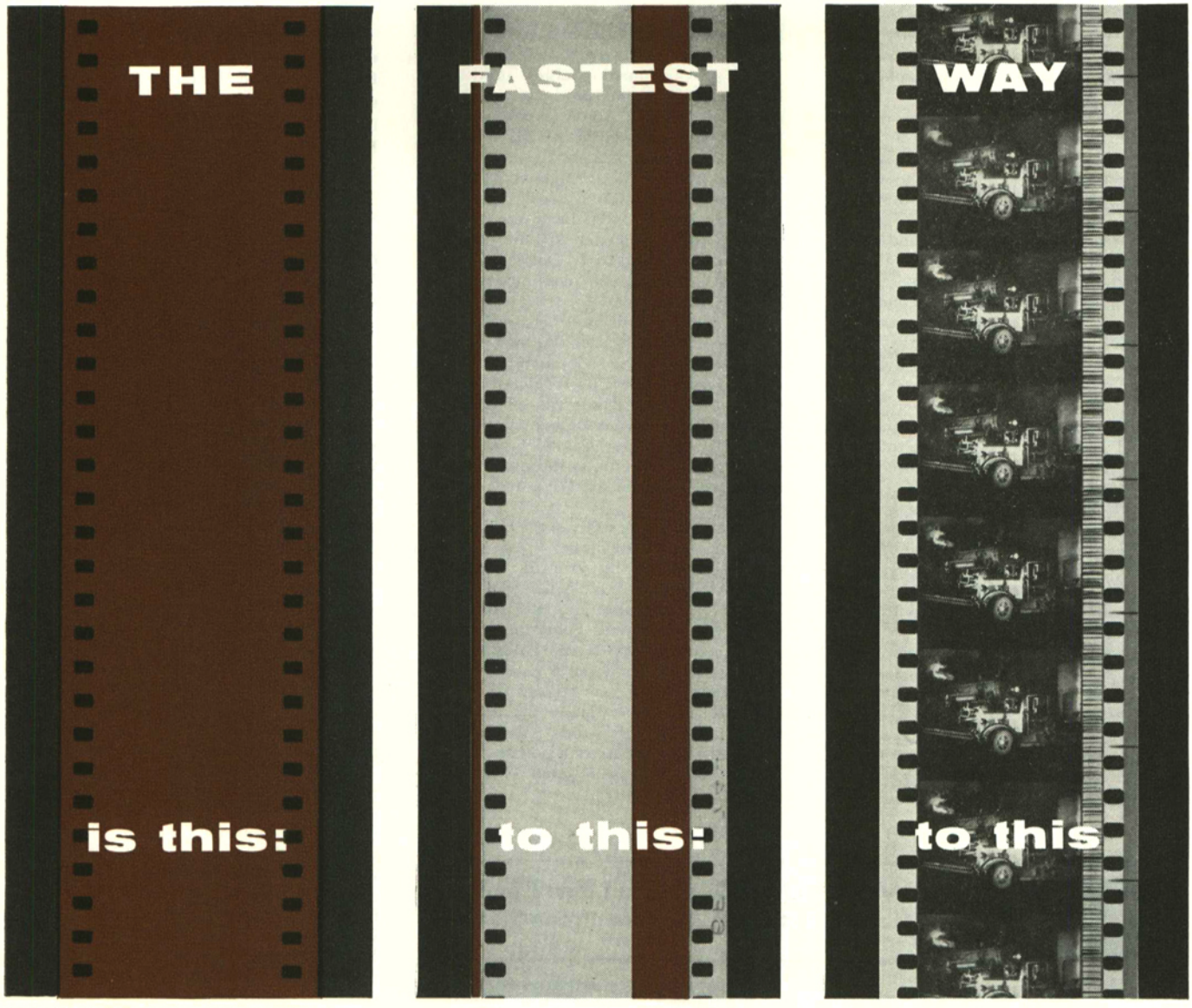
E. W. Walker described a 500,000 frames/sec rotating-beam image-switching camera, the resolution of which is improved by the use of a Kerr-cell high-speed shutter. The rotating mirror of this camera is driven by a pneumatic motor described in a paper by Maj. F. H. Coates.

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-



FULL COATED 3 CHANNEL RECORDING

MAGNA-STRIPE® FOR EDITING

OPTICAL SOUND RELEASE PRINTS

LET SOUNDCRAFT MAGNETIC FILMS

- SPEED YOUR SOUND PRODUCTION
- BETTER YOUR SOUND QUALITY
- SAVE YOU MONEY

Do as progressive film producers do. Make virtually distortion-free, full fidelity sound tracks—*fast* . . . with Hollywood-accepted, time-proved Soundcraft Magnetic Recording Films.

Soundcraft coated films are made with the same superior magnetic coating used on Magna-Stripe, the development that won Soundcraft the coveted "Oscar" of the Academy of Motion Picture Arts and Sciences in 1953.

When you use *both* Soundcraft full-width film for original recording and Soundcraft Magna-Striped Film for editing and mixing, you are assured of maximum fidelity release prints without time-consuming, intermediate photographic-track processing.

Both the 35-mm and 17.5-mm Soundcraft full-coated stock come with or without footage marks. The 35-mm stock is also available coated between sprocket holes only, where a clear edge is desired. Full-coated 16-mm is available with either single or double perforations.

For full details on how Soundcraft Full Coated and "Oscar"-winning Magna-Striped Films can improve your original and edited sound tracks, speed your work, and open new business frontiers, write Dept. AB11.

All Soundcraft magnetic films use a 5-mil tri-acetate safety backing. They are extremely compliant for intimate head contact. Full-width film is Micro-Polished® to remove minute surface defects, and assure perfect frequency response right from the start. Output variation is ±½ db. within a reel, ±1 db. reel-to-reel.

REEVES SOUNDCRAFT CORP.
10 East 52nd St., New York 22, N. Y.

graphic work were dealt with by P. T. Cahill, while L. Dawson gave details concerning the special case of tungsten lighting.

Sensitive Surfaces

In a brilliant lecture, Prof. H. J. Frieser discussed the properties of sensitive surfaces for very short exposures and the various aspects of reciprocity failures. He showed that the reciprocity law is again valid for exposure times in the microsecond range, with a reduced sensitivity. He also described the influence of pre- or postsensitization under various developing conditions.

The new Kodak emulsions, particularly the Tri-X, were presented by Mr. de St. Germain.

Applications

J. H. Waddell, F. Van Vyve and Col. Marchal presented a number of films showing the possibilities of commercially available cameras (Fastax, M.G.D. and Kodak) for armament research.

U. Ericsson and Capt. J. R. Dath have made use of spark photography for the study of the influence of air density on the velocity of a detonation and that of the thermal discontinuity surfaces due to the interaction of two shockwaves.

Using the Cranz and Schardin multiple-spark arrangement, W. Struth has been able to determine armor-penetration forces with an accuracy of 10%.

Detonations have been studied by means of Kerr-cell shutters by M. Sultanoff, R. von Heine-Geldern, J. Viard, E. Fünfer and W. Müller. Von Heine-Geldern showed the possibilities of backlighting by means of explosive wires to make visible the metal jet of shaped charges amidst the luminous detonation products. J. Viard makes use of the argon explosive flash-lamp (Muraour's flashes). M. Sultanoff and J. Viard complement the information supplied by high-speed single exposures by space-time recordings on streak-cameras.

X-Ray flashes have been used by R. Schall and G. Thomer for the study of shaped charges and by L. Deffet for that of mining explosives, in conjunction with spark photographs.

Schlieren methods have been used by H. Le Boiteux and E. Curé, also by J. Valensi and Guillaume, for visualizing subsonic and supersonic flows, by L. Pichon and R. Outurquin for studying ram-jet combustion, and by W. Kraus for analyzing mixing and agitating processes. Th. Fromme described an achromatic interferometer of the greatest interest for the study of transient phenomena.

The photo-elastic study of the behavior of materials under dynamic stress was the subject of papers by Prof. H. Schardin, D. G. Christie, Dr. H. Schwieger and F. Zandman. Schardin and Christie make use of the Cranz and Schardin multiple-spark cinematograph for the study of stress and fracture propagation in glass and plastics, while Schwieger records the birefringence photo-electrically for analyzing the shock of two glass-rods. F. Zandman has studied the failure of a notched bar for various locations of the notch with respect to the loading point.

Special mention should be made of the reflection schlieren method used by Prof. H. Schardin and H. Hänsel for studying the elastic and nonelastic surface deformations in metals subjected to dynamic loads. H. Reichenbach makes use of the Cranz and Schardin multiple-spark arrangement for studying the tearing and bursting of plastic sheets.

Atomization processes have been studied by W. Diamant, R. Kling and R. Leboeuf, N. Manson and S. K. Banerjea, F. Deveauvais and L. A. Sackmann; Diamant makes the jet image stationary by means of a rotating mirror, while the others make use of flash illumination.

J. H. Waddell, Allain and de St. Germain showed the possibilities of the Fastax and Kodak high-speed cameras for the investigation of many industrial processes, while M. Leblanc determined the exposure and rate characteristics of a camera for the study of machining processes. K. Pfister observed chip formation on a lathe and coke combustion in a blast furnace, J. Galey and J. Stremsdoerfer the distortion of an ingot during rolling.

J. Brillié and J. Bergougnoux presented the beautiful film of the Air Liquide Laboratories on welding processes in argon.

Finally, stress should be laid on the session devoted to biological and medical applications, which opened with a lecture by Dr. A. R. Michaelis showing applications in anthropology and psychology. J. H. Waddell presented remarkable color films on human vocal chords, ear-drums of cats, the heart of a dog and the human heart. A remarkable film on the human vocal chords, taken at 8,000 frames/sec, was also shown by K. Pfister. Dr. Vallancien compared the use of stroboscopy and high-speed motion pictures for the study of vocal chords. Prof. Piedelièvre and Dr. Michon have derived from high-speed photographs, radiographs and motion pictures interesting conclusions as to the behavior of wounds by fire-arms. Finally, Dr. D. A. McDonald has developed a cinematographic method for measuring the velocity of arterial blood flow.

Interest in such an exchange of information seems to give ample justification for the first two symposia on high-speed photography and cinematography being succeeded by others in the future. For this purpose, a provisional committee for promoting the methods of photographic and cinematographic observation of transient events was set up as an outgrowth of the group already formed by the Organizing Committee of the 2d Symposium and its Foreign Delegates. It was decided that Symposia would be held at 2-year intervals and that the next three would meet in England, Germany and the United States.

The complete Proceedings of the 2d Symposium will be published by the AFITEC. They will sell for between 2000 and 3000 francs, depending on the number of orders received. Orders should be addressed to: The Organizing Secretary, Ing. Ppal P. NASLIN, L. C. A. Fort de Montrouge, Arcueil (Seine), France; payment on delivery. Each paper will be printed in the language chosen by its author (French, English or German); the summaries and figure captions will be printed in all three languages.—*P. Naslin.*