

## books reviewed



### Introduction to Electron Microscopy, 2nd. Ed.

By Cecil E. Hall. Published (1966) by McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y. 10036. 384 pp. + index. 311 illus. 6 by 9 in. Price \$17.50.

The revised edition of Professor Hall's text on electron microscopy is a striking testimony to the expansion of the many phases of science and technology involved in this field. The book makes it quite evident that it is no longer possible for a single volume to accomplish what the first edition did with notable success some thirteen years before; viz., it served as a model textbook for an introductory course in electron microscopy, while at the same time it became a standard reference for many original investigations in the field.

The book was written to serve the former of these purposes, i.e., as a textbook in a one-term lecture and laboratory course in electron microscopy at M.I.T. For this use it succeeds admirably. A student who has become familiar with the material it covers will have a sound background in electron optical principles and will, at least, be aware of almost all of the topics he is likely to encounter in practicing electron microscopy.

The subject emphasis tends to reflect to some extent Professor Hall's field of molecular biology. Topics particularly applicable to the electron microscopy of metals and crystalline solids are not excluded, but these frequently are the ones handled only descriptively or illustratively. The selection of specimen techniques, while not exhaustive, is representatively broad, and many are described in detail. The examples of applications also tend to emphasize biological studies to some extent.

Altogether, this book sets a rigorous standard of subject matter to be included in an introductory course on electron microscopy. As a reference book for practicing electron microscopists, however, it cannot be as useful, even after this very good job of updating, as one of the many more specialized but more detailed texts now available.—*J. F. Hamilton*, Eastman Kodak Co., Research Laboratories, Rochester, N.Y. 14650.

### Special Effects in Motion Pictures

By Frank P. Clark. Published (1966) by Society of Motion Picture and Television Engineers, 9 E. 41 St., New York, N.Y. 10017. 238 pp. Illus. 5½ by 8½ in. 6 by 9 in. Price \$7.50.

The arts and crafts of special-effects from the "beheading" in the 1893 Edison version of *Mary, Queen of Scots* to the "de-

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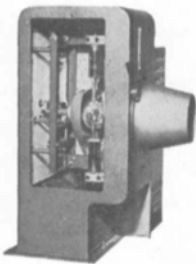
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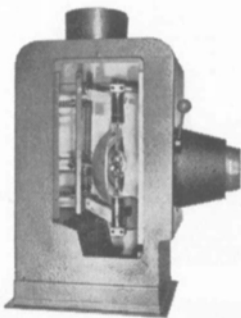
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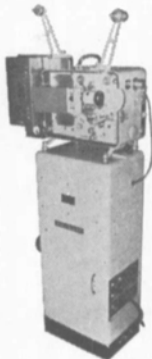
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ceased" William Holden floating on the surface of the water as seen from the bottom of a pool in *Sunset Boulevard* are explored in detail in this remarkably compact and informative book by Frank P. Clark.

In tracing the history of effects from the French pioneer, Méliès, this work also becomes a history of "the special-effects man" who made his appearance in the early twenties as a "stunt man," "powder man" or "crack shot," and who reached professional maturity in the middle thirties, earning a description awarded by the author: "The special-effects man must possess skills of many crafts, with the inventiveness of an Edison, combined with a generous dash of artistic creativity. He must be a happy combination of artist, mechanic, carpenter, gadgeteer and inventor. He might also be an explosives engineer, a crack shot, a skin diver and a daredevil. He must have a healthy imagination and be willing to experiment with new ideas. Finally, he must be a perfectionist. No effect is successful if it does not work perfectly."

The author's last statement is suggestive of both the book's greatest strength and one of its potential weaknesses. In detailing, with care and accuracy, effects ranging from anthropomorphic robots to knot-tying, from earthquakes to cobwebs, there is a tendency to oversimplify and possibly thereby inadvertently mislead the amateur into attempting some of the dozens of intriguing and apparently easy effects which simply won't come off without the professional touch or which, in fact, may be downright dangerous. Although the author repeatedly inserts cautions when describing some of the trickier effects such as pyrotechnics, the book is so engagingly and effectively written that it practically invites experimentation. Over a hundred illustrations and diagrams amplify the text which is remarkably interesting and lucid considering the burden of technical content it carries.

Old timers will remember that it wasn't so long ago that many special-effects techniques were deep trade secrets. The pros and cons of different methods of achieving atmospheric effects (snow, rain, clouds, fog, smoke, etc.) are ably discussed; special-effects props (at least 50% of which are intended for destruction) are described; and optical and sound effects are detailed in a way that low-budget producers and many amateurs could easily duplicate. Miscellaneous special effects, shootings and pyrotechnics are described from the professional point of view, although, as the author attempts to make clear, they should not be attempted by the inexperienced hand, both because of physical and, in some cases, legal hazards involved. An awareness of the potential of such effects, however, should be of extreme interest to writers, producers and directors, thus extending their knowledge of the values that such effects may bring to a work which they share with the special-effects man.

The influence of developments in the fields of electronics and plastics on the sophistication of special-effects is notable. The uses of Styrofoam, polystyrene resin, thermoplastics, polyurethane, urethane elastomers, methyl cellulose, glass-fiber reinforced polyesters, and the like, are described for many types of effects and some

formulas are given. Seventy-two sources of special-effects materials are listed, together with a good bibliography on the subject.

This book, a chapter-by-chapter description of which may be found in the March 1966 issue of the *Journal*, is also an admirable companion-piece to *The Technique of Special Effects Cinematography* by Fielding, reviewed in the January 1966 issue of the *Journal*, and is highly recommended to both the professional in film production and to the serious student of a medium which owes much of its magic to the special-effects man.—Robert W. Wagner, Dept. of Photography, The Ohio State University, 190 West 17th Ave., Columbus, Ohio 43210.

### Educational Facilities With New Media

Alan C. Green, ed. Published (1966) by Department of Audiovisual Instruction, National Education Assn., 1201 Sixteenth St., N.W., Washington, D.C. 20036 (in collaboration with Center for Architectural Research, Rensselaer Polytechnic Institute). In three parts, pp. A-1-55, pp. B-1-99, pp. C-1-55 + Introduction and Foreword. Illus. Diagrams. 11 by 8½ in. Paperbound. Price \$4.50.

While this book is intended primarily for educational administrators and architects, it should also be of interest to engineers concerned with the application of motion pictures or television to education in schools. The "new media" with which the book is concerned are largely motion pictures, slides and television. Since it is expected that schools of the future will use such media very extensively, it is important that the learning areas be designed to utilize them to the best advantage.

Report A, "A Guide for Policy Makers," is a brief summary of recent educational innovations and the use of "media" to provide better education. Considerable emphasis is given to proposals for local production of "media," as well as their use in classrooms. It should be noted that "media" are proposed to assist, and not to replace, the teacher.

Report B, "A Guide for the Design Professions," is devoted to the design of classrooms, lecture and laboratory rooms, and auditoriums. In each case the floor plan, seating arrangements and projection facilities are particularly suited for optimum use of projected or transmitted images. Production facilities are included in the suggested plans.

Report C, "A Technical Guide," covers lighting, acoustics and "climate," as well as seating. The section on "hardware" should be especially useful to administrators and architects since it deals with the basic conditions necessary for good projection. These include a discussion of front and rear projection, the effect of ambient light, properties of screens, screen brightness, viewing angle and viewing area.

Altogether, the Department of Audiovisual Education should be congratulated on a book which should bring a better understanding of the technicalities of image projection to those who design and those who administer schools. Engineers may also find it a valuable guide to future equipment

requirements.—Clyde R. Keith, Sound Recording Consultant, 240 E. Palisade Ave., Englewood, N.J. 07631.

### Machine Devices and Instrumentation

Ed. by Nicholas P. Chironis. Published (1966) by McGraw-Hill Book Company, 330 W. 42 St., New York, N.Y., 10036. 359 + vii pp. incl. Index. Illus. Diagrams.  $8\frac{1}{2} \times 11$  in. Price \$10.00.

This reference work may be useful to engineers and mechanical designers who are engaged in automatic machine design, industrial process control and instrumentation. It contains about 100 articles printed verbatim from *Product Engineering* and similar publications.

A few drawbacks for the user are apparent. Because original headings and type faces have been retained, each new article may have a completely different appearance. There is the distraction of interesting but unrelated items, such as the description of a novel open-end wrench. The organization and usefulness could have been improved by dividing many of the articles, deleting extraneous and obsolete matter, and combining the parts into unified and more comprehensive sections such as Dwell Mechanisms, Timers, Coupling, etc. Without this effort, the few tutorial articles (such as "Eight Methods of Measuring the Moment of Inertia") that appear seem out of place.

On the good side, the book describes a great many mechanisms and explains them by the use of sufficient graphs and excellent schematic illustrations. The sections on electrical and fluid power control devices, and thermo-, pyro-, photo-actuated devices are useful and handy for the mechanical engineer or designer. The book should be very useful for brainstorming sessions where several alternate solutions to a particular design problem could be compared.

Happily, those long-winded articles with pages of equations that used to appear in *Product Engineering* are few and far between in this book. The greatest emphasis is on mechanism design suggestions. The details of how to implement them are left to the resources of the engineer or designer.—Herbert Davison, Barnes Engineering Co., 30 Commerce Rd., Stamford, Conn.

### Amplifier Handbook

Editor-in-Chief, Richard F. Shea. Published (1966) by McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y. 10036. 1,516 pp. Diagrams. Tables. 6 by 9 in. Price \$37.50.

One of the major contributions to the technological explosion has certainly been the extraordinary progress made in achieving amplification, particularly of a signal. Historically, the valve is old as an amplifier in the control of fluids, and a later amplifying device is the electrical relay. With the advent of radio, starting with the coherer, which is all but forgotten now, the art of amplification has made giant strides. Enormous improvements came with the audion and its derivatives, and now it is the turn of the transistor, with its issue — all these and others not mentioned besides, now serving in many fields besides radio.

With such a wide gamut of uses and techniques for the amplifier, a handbook presents a formidable challenge. The editor senses this, and in the preface outlines his limitations on the scope of the book to electronic, magnetic, piezoelectric, ionic-electrolytic and stimulated-emission devices. However he also adds a few miscellaneous circuits normally used in conjunction with, or incorporated within, amplifiers.

The handbook was written by a staff of 30 specialists and is divided into three parts. Part I discusses amplifier fundamentals, namely network theory, matrix representation and filters, and closes with the all-important subjects of feedback theory and noise. Part II discusses actual devices which essentially perform the amplification. It covers magnetic amplifier devices, electron tubes, transistors and other solid-state devices, induced-emission principles and devices, ionic-electrolytic devices, and various types of ceramic devices. Part III covers the amplifiers and amplifier circuits themselves. It includes audio amplifiers, dc amplifiers, operational (building block) amplifiers, high-power amplifiers, magnetic amplifiers, ionic-electrolytic amplifiers, magnetic amplifiers, nonlinear amplifiers, microwave amplifiers, diode and parametric amplifiers, induced-emission amplifiers (and oscillators), acoustic-wave piezoelectric amplifiers, and integrated circuits.

In each case there is provided a carefully written introduction that can serve somewhat as a condensed textbook on the topic. This is not always adequate, however, and in the more difficult cases the less prepared reader will need to consult the references for a more complete introduction. They are plentiful—the whole book contains some 700 references.

The reader may be struck by the observation that, although a substantial proportion of the development of amplifiers has derived from the communication arts, none of the contributors to the handbook comes from a communications firm. This has resulted in a certain under-emphasis of the communications problems involved in the amplifiers. For example, the noise discussed is strictly internal noise; general equalization and predistortion problems in amplifier design are not mentioned; dc restorers of a type used with computers are discussed, but not the clampers used on amplifiers in television transmission, and so on over a wide range of illustrations. The reader may also have some misgivings on the sufficiency of the index, in spite of its 19 pages. As two examples only: video amplifiers are listed in the table of contents, but not in the index. Several Smith charts are depicted on pp. 13:6-7, and pp. 28:11-18, but are not listed in the index.

All in all, the handbook is a remarkably comprehensive reference work for an important segment of the electronics art. Almost any engineer in this art encounters amplifiers at one time or another and he will find this book useful if he is involved in their analysis, design, or special application.—Pierre Mertz, Consultant, Lido Beach, L.I., N.Y. 11561.

**Feature Films on 16: A Directory of 16mm Sound Films Available for Rental in the United States**

Ed. James L. Limbacher. Published (1966)

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by Continental 16, Inc. (A Division of Walter Reade-Sterling, Inc.), New York. Distributed by Educational Film Library Association, 250 W. 57 St., New York, N.Y. 10019. 102 pp. 8½ by 11 in. Ring-bound. Price \$5.00.

This directory is a compilation of feature film titles in 40 of the largest and most representative rental libraries throughout the United States. It seems to be the first such inclusive and convenient compilation and will undoubtedly be a great timesaver for users of 16mm films. About 90% of all feature films generally available in this

country are included in the listing. Films are listed alphabetically by title. Those available under more than one title or that have had their titles changed in transition to the 16mm field are cross-referenced. The listing includes the year of release, names of the stars, running time, country where produced, and rental availability. Names, addresses and telephone numbers of distributors are listed at the end of the directory.

It is planned to issue supplements at regular intervals and a complete new edition every third year.—*Edit.*



DETROIT, Jan. 27-28—The Color Television Broadcasting Conference and Workshop, a quad-section meeting of the Chicago, Detroit, Rochester and Toronto Sections was held at the Rackham Building in Detroit Jan. 27-28 (See Dec. 1966, *Journal* p. 1230), in cooperation with the University of Michigan Television Center and Extension Service.

A special committee of Howard Town, Conference Chairman; F. M. Remley, Conference Topic Chairman; J. F. X. Browne, Publicity Chairman; and F. Zimmerman, Conference Coordinator, developed a very interesting program of papers on color television with much breadth and scope. In spite of the extremely heavy snow conditions, the program was completed with only minor revisions due to some authors' inability to reach Detroit.

The program was presented as detailed in the December *Journal*, with the addition of five papers added after the *Journal* was published. Only one paper mentioned in the *Journal* was not presented, "Color Fidelity in Camera Systems," by Joseph F. Wiggin. Papers added after the *Journal* was published were "Multiple Generation Television Recording Techniques," A. C. Luther, RCA; "Technical Lighting Requirements for Live Color Cameras," by Dr. Henry Kozanowski, RCA; "Lighting and Staging Practices for Color," by Carlton Winkler and John Whittaker, CBS; "Q. I. and You; Lighting for a Change," by Joseph N. Tawil, ColorTran; and "SMPTE Color Test Films and Slides," by John Waner, Eastman Kodak Co.

Total registration for the two-day meeting was approximately 600, with about 400 in attendance. The severe weather conditions prevented many from reaching the meeting. Under the circumstances, the large turnout was termed very gratifying and only three of the 21 scheduled papers were not presented.

Considerable interest was shown in the conversion of monochrome facilities for color, and in the problems of quality control in film and tape transmission. Two panel discussions on video tape and live color cameras appeared to be extremely valuable based on the participation of the audience in the discussion.

Many persons requested copies of the papers, which were impossible to provide. The registrants indicated considerable

interest in holding another such meeting soon.

The meeting was terminated with a banquet at the Park Shelton Hotel. Principal Speakers were Howard Town, Conference Chairman, and G. Carleton Hunt, President of the SMPTE.

The meeting was regarded by all as a success. Special thanks should be given to Fred Remley, the University of Michigan Extension Service; John F. X. Browne, Jr., Chairman of the Detroit Section, and other members of the Detroit Section who devoted considerable time and effort in making the meeting so successful.—John A. Campbell, *Secretary-Treasurer*, Detroit Section, The Jam Handy Organization, 2821 E. Grand Blvd., Detroit, Mich. 48211.

ROCHESTER, Feb. 9—A paper on "Color Fidelity in TV Camera Systems," was presented by Joseph F. Wiggin, Audio-Video Consultant, Design Engineering Group, General Electric Co., Syracuse, N.Y., to the Rochester Section Meeting held at the Dryden Theater. The meeting was attended by 95 members and guests.

Wiggin discussed the fidelity of color reproduction in television pictures originating from a live camera and how it is affected by such factors as the camera filter characteristics, signal processing, encoding and decoding errors, the characteristics of the phosphors used in the display tube, and the white balance adjustment of the display tube. The discussion included an evaluation of the color fidelity and television reproduction, assessing the factors involving color fidelity and reproduction.

A theoretical analysis was made of the color reproduction of the GE live color camera. Comparisons were made of three tube and four tube cameras. Effects of shifting the chromaticity of the separate luminance camera to change saturations were described and illustrated.

The program was preceded by a motion picture entitled *Snow*, produced by the National Film Board of Canada. The speaker was introduced by Lisle Conway of the General Electric Co., Syracuse, N.Y.

A premeeting dinner was held for the speaker at the Treadway Inn.—Robert O. Gale *Secretary-Treasurer*, Eastman Kodak Co., 343 State St., Rochester, N.Y.