

books reviewed

Photographic Processing Chemistry

By L. F. A. Mason. Published (1966) by Focal Press, 20 E. 46 St., New York, N.Y. 10017. 321 pp. incl. Appendixes, Indexes, Illus., Diagrams. 9 1/4 by 7 in. Price \$15.

This book is intended for chemists interested in the academic and/or the practical side of the chemistry of photographic processing. It meets this goal quite well giving a well-balanced coverage of theory, experimental studies and practical commercial processing. The author is well qualified, being leader of the Processing Section of Basic Research Laboratories of Ilford Ltd. He starts with a simple question "what is photographic development?" He answers it, first briefly introducing the main points of selective reduction of exposed silver halide, chemical and physical development and the main ingredients in a

developer and their functions. Next he discusses the classes of developing agents and the relationship of pH and developer activity, the several functions of sulfite, halide and fog restrainers.

The author covers chemistry of hydroquinone, Metol and Phenidone in detail, giving their role as reducing agents and considering ionization of weak acids, free radicals, catalytic effect of reaction products and superadditivity. There are several examples of the unique suitability of electrochemical techniques, especially polarography and potentiometry, to studies of development. Spectrophotometry and electron spin resonance are also mentioned in studies of the role of free radicals.

The mechanism of development is discussed, first as a redox reaction, then the main theories are given: supersaturation by Ostwald, adsorption and catalysis by James, and electrode reaction by Gurney and Mott. Next the kinetics of physical and chemical development are covered including the activation energies of solution of silver halide and diffusion through water, gelatin and in the crystals of silver halide and image silver.

Phenidone and Metol are then compared in terms of use in liquid concentrates and mono-baths, bromide buildup, superadditivity in oxidized developers and cost. Some principles of replenishment are given and the formulas and explanations of the choice of ingredients in developers for negatives, fine grain, high acutance, tanning, thick nuclear emulsions, paper, rapid processing, etc. Metal ion developers are included.

The section on fixing and stabilization covers the use of sodium and ammonium thiosulfates, rates of fixing and the important pH balance affecting the stability of thiosulfate and hardening ability. Silver recovery methods are described as is the use of silver complexing agents as stabilizers to avoid washing.

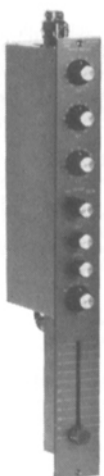
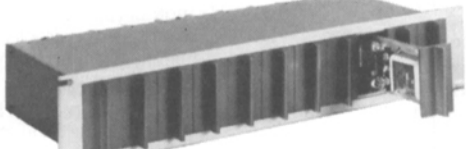
In washing, drying and miscellaneous, the problems of getting hypo and complexed silver out of paper and films for archival storage are covered along with tests for residual sulfur and silver compounds that can attack the image and cause stains. Reticulation and the changes in image silver structure and covering power during drying are discussed.

Formulas and applications are given for bleaches, reducers, intensifiers and toners but there is no mention of the image etching solution containing cupric ion, bromide, acid and hydrogen peroxide used with litho films.

In color processing, the principle of subtractive colors and its application in reversal and positive negative systems are covered. Color developing agents are discussed in terms of activity, hue of dye formed, solubility, dermatitic properties and diffusion of oxidized developer. Systems with couplers in developers or in emulsions are described with many schemes of successive exposure, development and bleaching. Color negatives, masking for color correction and positive printing are discussed briefly.


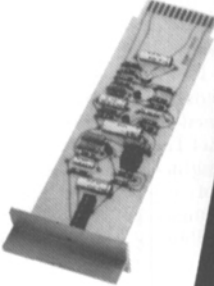
The final chapter describes new types of color developing agents and couplers hav-

innovations in components . . .






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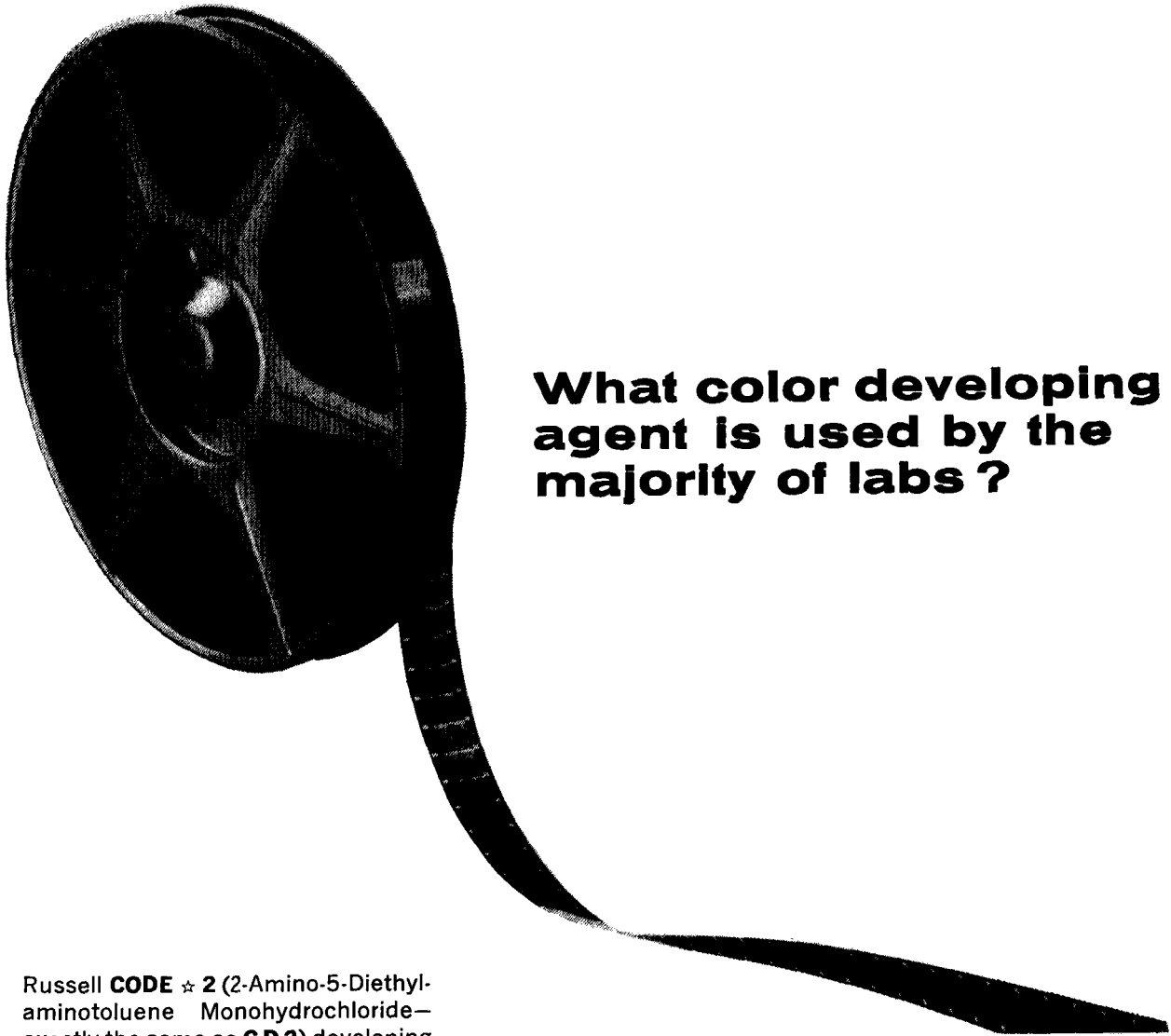
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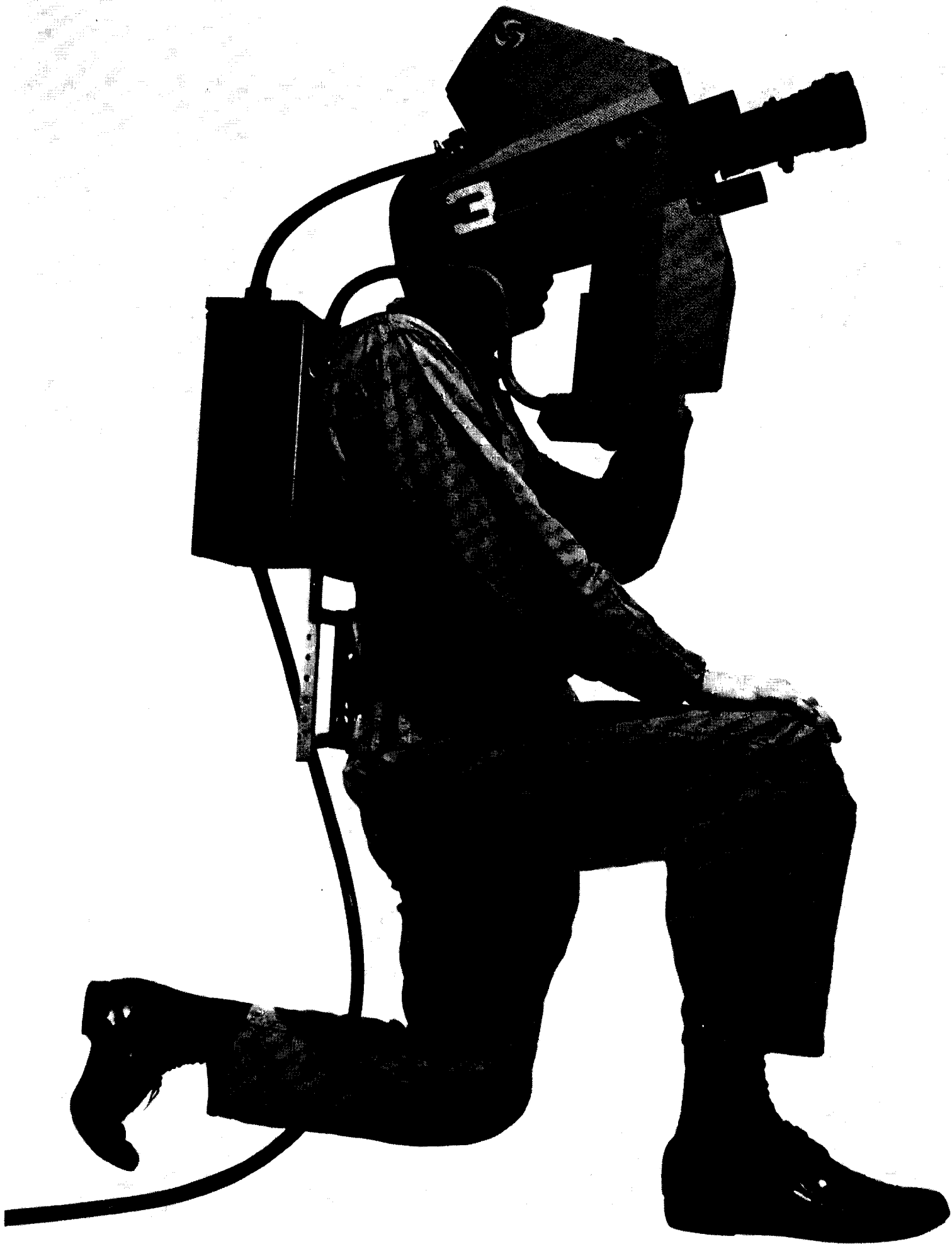
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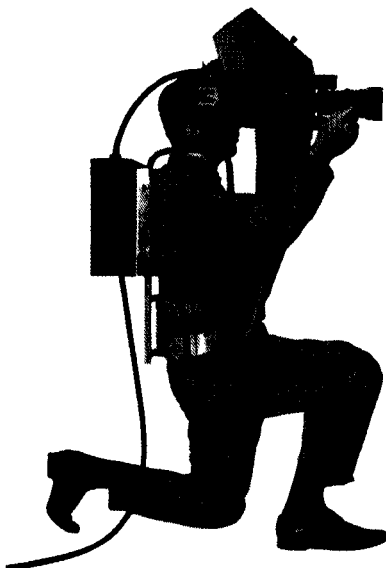


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ing purer colors and better stability to light than those now in use, which were proposed by Fischer and Siegrist over 50 years ago. The chemistry of the silver dye bleach process for making prints from positive transparencies is covered. It gives better light fastness, color purity and sharpness than color coupling.

Appendix I gives a listing of standard specifications for photographic chemicals and Appendix II lists materials for construction of photographic equipment, their relative merits and suggested tests before use.

This book will be a very useful text for those new in processing and is a good reference for experienced processors wanting to review recent theories. To some it may suggest further basic studies on photographic development. Some subjects are repeated, apparently to cover them at two levels and to make chapters more complete. About two dozen minor and obvious typographical errors were noticed but equations and tables were not examined critically.—*Dr. John G. Lofstrom*, Photo Products Dept., E.I. du Pont de Nemours & Co., Parlin, N.J. 08859.

Analysis and Design of Integrated Circuits

Ed. David K. Lynn, Charles S. Meyer and Douglas J. Hamilton (Prepared by the Engineering Staff, Motorola Inc., Semiconductor Products Div.). Published (1967) McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y. 10036. 545 + xxv pp. incl. Index, Glossary, Appendixes, Diagrams. 7 by 10 in. Price \$16.50.

This book with the others in this series comprise the text that was used by Motorola in their Integrated Circuit Course.

Before the design of an integrated circuit can begin, a sound basis of the IC process must be implanted. Component limitations, parasitic components, transistor and diode models must be established. These fundamentals plus the variations in IC devices that can enhance circuit performance are discussed in depth as well as thick and thin film processing and hybrid configurations.

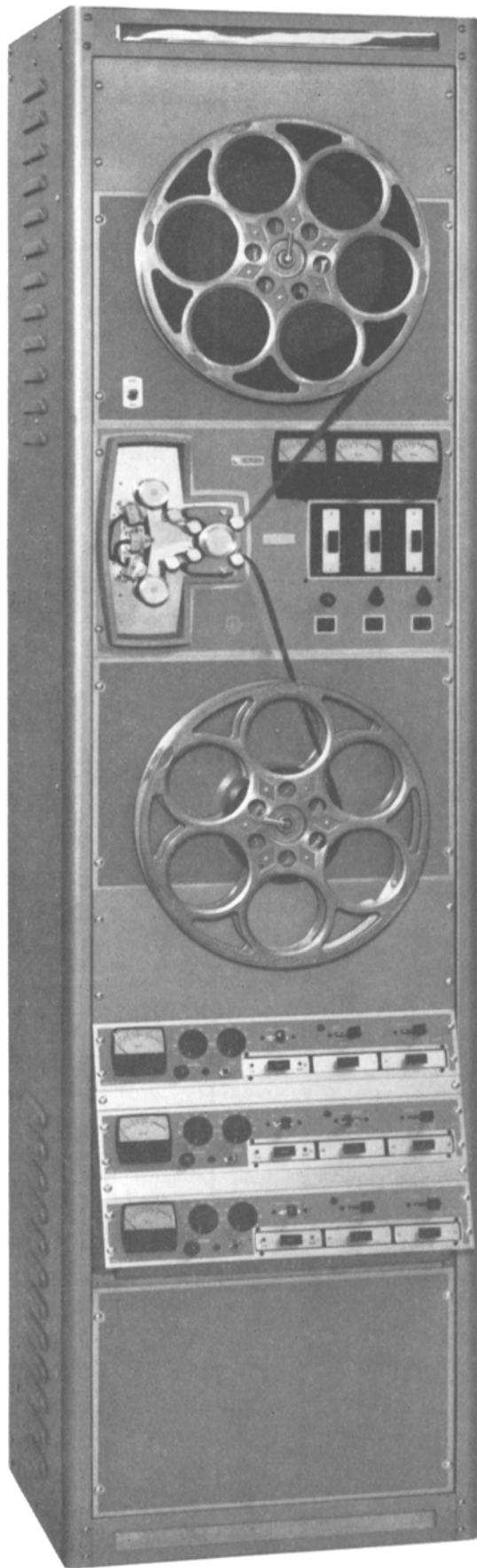
Once the fundamentals are established, the second part of the book goes into the design of logic gates, DCTL, DTL, T²L and ECL, devoting a chapter to each. Although slanted toward the IC logic element the depth of material would also appeal to discrete component logic designers.

Several tables summarize the four logic gate design equations from logic levels to delay times. Power supply noise and externally generated noise in the form of high RF and pulse ambients are also considered.

The third section deals with the linear IC transistor model. Gain, stability and maximum frequency of oscillation of the IC transistor are analyzed and a comparison is made with the discrete transistor. Noise figure for the three basic amplifier configurations is discussed.

The differential amplifier, a basic IC building block is reviewed, using Middlebrook's methods and a comparison of the integrated and discrete differential amplifier is given. A layout of a simple differential amplifier is shown with an explanation for the locations of the components.

High-frequency tuned amplifiers are considered with further discussion of noise












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figure as related to possible circuit configurations. Several designs and layouts of IF amplifiers are given. A complete 60-MHz amplifier illustrates construction and packaging techniques using IC's. RF amplifier design procedures are given using the techniques of Linvill and Schimpf.

The concluding chapter discusses the future of IC's with a suggestion that the future IC may not resemble today's in terms of processing or devices. A table is included comparing nature's logic building blocks, the neuron, and the IC gate from atomic content to propagation delay.

The more recent designs incorporating the metal oxide semiconductor processes are not covered in this text and it seems only reasonable that such might provide material for another IC book.

This is an excellent and most comprehensive book merging the theoretical and practical world of IC design.—*H. A. Willinger*, 14 Moores Mill-Mt. Rose Rd., Pennington, N.J. 08534.

One Reel a Week

By Fred J. Balshofer and Arthur C. Miller (Foreword by Kemp R. Niver). Published (1967) by University of California Press, Berkeley, Calif. 94720. 218 + x pp. Illus. 6 by 9 in. Price \$6.95.

This delightful book makes the reader feel as if he were engaged in conversation with two gifted and knowing "old timers" whose reminiscences bring alive the exciting era when the world of motion pictures was very young. Each chapter in the book was written by one of the two authors, an appropriate device for the conversational, informal style.

Beginning at the turn of the century (1905 to be exact), the book gives us an eyewitness account of half a century of movie-making. One of the best things about this book is its objective, understated style. For example, in Chapter 10 (Balshofer): "Charlie Chaplin was a fine comedian but that was only partly responsible for his success. He quickly learned to discard the old footage yardstick technique for cutting moving pictures, substituting instead delicate touches, such as a slight twist of the mouth, or a shrug of the shoulder that served as guide to cutting the action precisely. The entire comedy industry soon copied his cutting technique, but to this day I have never heard anyone mention it or give him credit." In view of the vast amount written about Chaplin, this is a gem.

Samplings from the book are hardly fair since every page contains information valuable to the historian of motion pictures as well as anecdotes for the average reader. However, it is a temptation to quote this bit from Chapter 9 on *The Perils of Pauline* (Miller). Mr. Miller photographed the famous serial and thus has every right to question the qualifications of the "would-be historian" who described *Perils of Pauline* as "crude." Mr. Miller adds, "He [the historian] also states that most of the people who were in the middle of things during what he calls 'those glorious days' are gone forever and their memories unrecorded. It may come as a surprise to him that I, who photographed *Perils of Pauline* am very much alive and feel compelled



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to straighten out a few things." This Mr. Miller proceeds to do.

The technical problems solved by cameramen in the "glorious days" are a tribute to the ingenuity of the motion-picture pioneers. For example (1906): "The camera lacked a finder or optical system for viewing the aperture. In order to focus, it was necessary to lean sideways, poke your head inside the camera, and focus on the emulsion of the film. After threading and focusing the film, the side door was closed. The crank was just forward of the door hinges."

According to Mr. Miller, "In the early days, laboratory work was just as important to the cameraman as his work with the camera because the combination of both equaled photography. Many cameramen accomplished trick photography partly in the camera and partly in the laboratory."

Other highlights of the book include the "patent fight" with Edison, which Mr. Balshofer recalls was "quite involved." However, his lucid account clarifies certain aspects of the historic tangle.

The book is full of information succinctly presented and the authors have un-

doubtedly achieved their aim of "providing a record of a little segment of the true history of the beginning and growth of movie-making in the United States."—*Edit.*

Modern Dictionary of Electronics (3d ed.)

By Rudolf F. Graf. Published (1968) by Howard W. Sams & Co., 4300 W. 62 St., Indianapolis, Ind. 46206. 608 pp. Illus. 6 by 9 in. Price \$9.95.

Some 16,500 terms are defined in this useful dictionary. Terms used in such fields as radio, television, communications, radar, electronic instrumentation, industrial and medical electronics, microelectronics, computers, data processing, lasers, logic, semiconductors and fiber optics. A Pronunciation Guide includes more than 1,000 frequently mispronounced terms. The dictionary also includes symbols used in electronic and electric schematic diagrams, symbols and abbreviations for commonly used electronic terms, the Greek alphabet and the semiconductor symbols and abbreviations that have been adopted as standard by the Electronic Industries

Association and the National Electrical Manufacturers Association. The dictionary also contains more than 400 illustrations.—*Edit.*

Handbook of Physics (2d ed.)

Ed., E. U. Condon and Hugh Odishaw. Published (1967) by McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y. 10036. 1,626 pp. + Index. 829 illus. 7½ by 9½ in. Price \$32.50.

For the second edition *Handbook of Physics* has been substantially revised and updated. New material on the theory of relativity, conduction of electricity in gases, and superconductivity, magnetic resonance, and nuclear physics is included. The emphasis throughout is on principles and a representative selection from the literature of physics is included. The book contains 92 chapters and is divided into nine sections: Mathematics; Mechanics of Particles and Rigid Bodies; Mechanics of Deformable Bodies; Electricity and Magnetism; Heat and Thermodynamics; Optics; Atomic Physics; The Solid State; and Nuclear Physics.—*Edit.*

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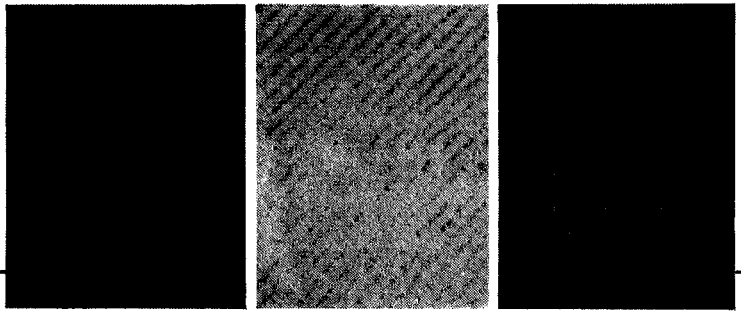
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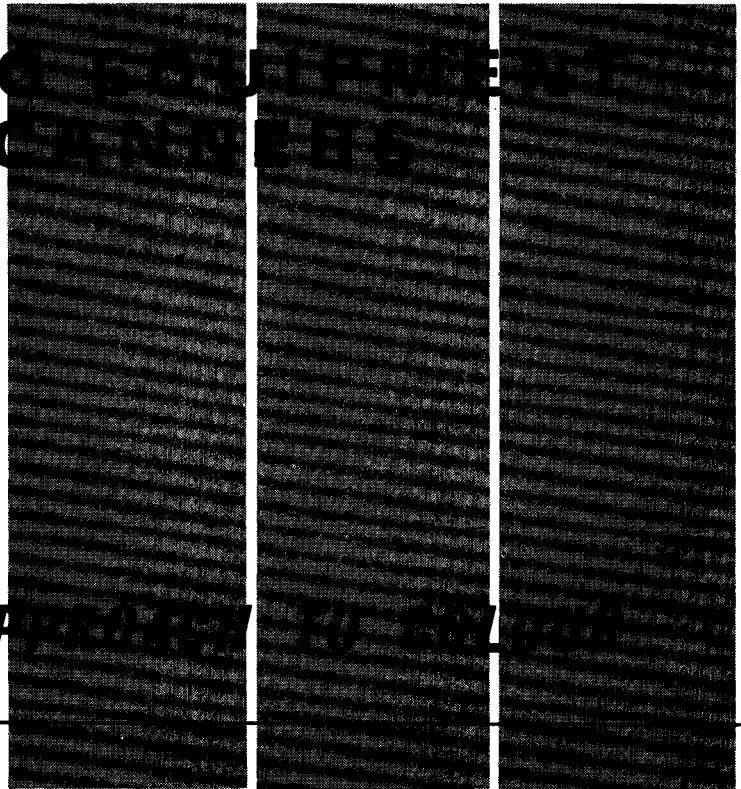
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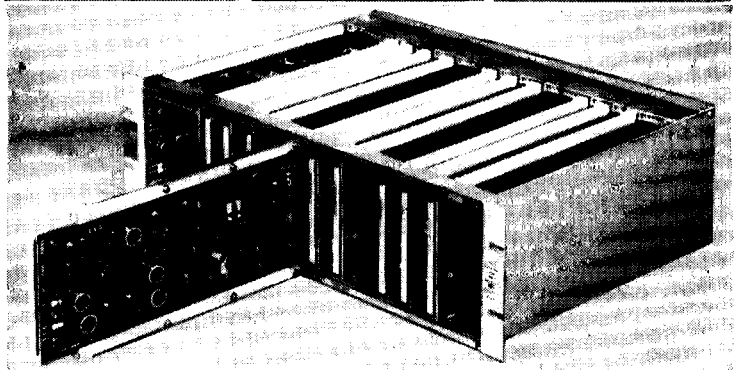
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