books reviewed

Maverick Inventor: My Turbulent Years at CBS

By Peter C. Goldmark with Lee Edson. Published (1973) by Saturday Review Press, 380 Madison Ave., New York, NY 10017, and E. P. Dutton & Co., 201 Park Ave. S., New York, NY 10003. 278 pp. 5½ by 8 in Price $7.95.

The author characterizes himself as a "maverick" inventor. He might also say "prolific," "exciting," and "aggressive," as he pushed his many inventions with great determination toward what he saw as a productive conclusion. The many experiences of the author illustrate the nemesis of all inventors — it is not only necessary for the invention to work well — it has to score in the marketplace before the inventor can reap a full benefit. And it must continue to score as time passes and conditions change. The author indicates the complex business of getting into the market. Capital and effective publicity are necessary, as well as timing, and the satisfaction that the invention gives must be of a nature to continue on for survival.

Throughout the book it is interesting to read of the author's continuing bouts in technology with David Sarnoff. For example, at one point he says, "The urge to beat RCA and its ruler, David Sarnoff, was such an overriding force at CBS that it actually began to shape the direction of my own career." This was especially vehement during the protracted color developments, but it continued throughout the many inventions. The author summarizes the color outcome itself reasonably, as "My work in color television resulted, I think, in bringing color to the public a decade faster than it might otherwise have come, though not exactly in the form I intended."

One notes the extensive early stress in this contest on color quality, where CBS scored by using color filters (that had received far more colorimetric study than phosphor luminescence, which RCA used in avoiding mechanical moving parts), and also by not using tricky color circuits. In the marketplace this advantage finally lost the battle to the completely compatible system — which incidentally is also more efficient in frequency band use. The fragility of the shadow-mask color tube caused qualms in the early days. There was not too much confidence in the industry that this was a suitable contraption for a household appliance. And yet so intense, and successful, was the work on it by the author's opponents (work which also included, as the author says, a contribution — eventually licensed to RCA — by one of his own staff) that it is in full current use, without a qualm and without requiring undue picture tube replacements.

Another important invention that the author goes into is that of the long-playing record. This required a great deal more study than merely the computations of the disc diameter, its speed, and the spacing of the grooves. Incidentally some work on the problems had already been done in the early development of sound motion pictures (the author gives credit only to their determination of the 33⅓-r/min record speed). However a great deal of time had to be spent on the whole system (from microphone to speaker) before a fully satisfactory sound reproduction was achieved. Later, smaller versions of the records and players were devised for automobile and also home use, but the marketplace was less kind to these.

The author devotes quite a bit of space to the vicissitudes of the development and promotion of electronic video recording (EVR). This was a narrow film that recorded a television program, fitted in a cassette, and it could be played into a home television receiver. Here the trouble largely turned out to be its introduction into the marketplace. A great many setbacks were encountered, and also during a certain period it was also proposed for school use. In the end it was completely given up by CBS, much to the author's chagrin. Incidentally during this adventure (but also to some degree for all the inventions) the author had tempestuous times with William Paley. However he closes the introduction to the book with a nice tribute to his former chief.

The author closes the book on reports of his efforts and contributions towards the revival and establishment of new "model" cities and communities. He considers one key problem of these to lie in the communications facilities which they can employ — apart from the person-to-person connection and the broadcast facility. He would like to see a "group-to-group" connection and a "talk-back" facility, to simulate in some way the characteristics of the old town meeting. He had also other ideas regarding community improvement, including some on the poverty problem.

The author was occasionally disappointed at the outcome of some of his efforts. He notes, "For instance, many Swiss villages are steeped in poverty, as were the settlements of the American pioneers, but somehow the environment is lifted from depression, perhaps because there is no constant reminder of minority status and inability to share equally community resources." Incidentally, the author himself could feel this strongly, as in his entry into America he was both poor and as a Hungarian was in a distinctly minority situation. However, he had the persistence and courage to overcome these limitations.

To close, the book is recommended especially to any prospective serious inventor, to disclose to him the kind of life he may be getting into — as told by one who is a conspicuous example of a survivor of the vicissitudes of that life. Other readers will enjoy the fascinating yarn on the strenuous life among technologists. — *Pierre Mertz,* Consultant, 66 Leamington St., Lido, Long Beach, L.I., NY 11561.

Color: Theory and Imaging Systems

Ed. Raymond A. Eynard. Published (1973) by the Society of Photographic Scientists and Engineers, 1330 Massachusetts Ave. N.W., Washington, DC 20005. 429 + xxi pp. Illus. Diagrams. 6 by 9 in. Paperbound. Price $12.00.

In November 1972, the Rocky Mountain Chapter of the Society of Photographic Scientists and Engineers hosted a two-and-one-half-day tutorial seminar on the subject "Color: Theory and Imaging Systems." The book was prepared from papers presented at that meeting, and contains contributions from many individuals. The theory, history and practice of color photography have been given a tutorial treatment, and each chapter is well referenced for those who wish to delve deeper into a particular subject.

In the first four chapters, theory is dealt with under the headings: Human Color Perception; Colorimetry; Color Densitometry; and Color Sensitometry. Chapter 5 gives a review of old and new methods of evaluating the image structure of color films. Chapters 6 to 10 are devoted to: Masking and Color Reproduction; Color Reproduction in Color Television; The Chemistry of Color Development; Color Reversal Silver Halide Systems; and Color Negative and Positive Silver Halide Systems. Chapter 11 describes the applications of silver dye bleach color copy materials, and in Chapter 12 the subject of color process quality control is reviewed. The remaining seven chapters are taken up with descriptions of various photographic processes and applications, including color films for aerial photography; generation of color imagery from earth resources technology satellite (ERTS) data return; earth resources multi-spectral photography; microfilming in color; rapid access color hardcopy; color xerography and 3M's color-in-color process.

In the Preface, the Editor remarks that scientific breakthroughs and inventions of the past two decades are just now realizing an important role in color imaging systems. The axiom of increased grain with increased film speed is being set aside and there now exist ways to effectively increase film sensitivity without increasing grain. Color hard copy reproductions can now be made in seconds, and the question is raised: Is a convenience color office copier necessary? These systems might be used by those in the photo-finishing industry who survive the instant-picture boom where a "universal" camera reversal original could have a twofold use — a transparency for projection or an intermediate for prints made by a color electrophotographic imaging system.

In the areas of motion pictures and television, the Editor predicts that electronic imaging in color may shortly begin to replace the use of film for color cinematography. Location shooting, television news and industrial photography may give way to electronic imaging systems on the drawing board that are miniaturized to the extent that these electronic cameras could be the size of our well-known motion-picture cameras. However, his assertion that "productions recorded electronically *can* be edited electronically" could be ques-

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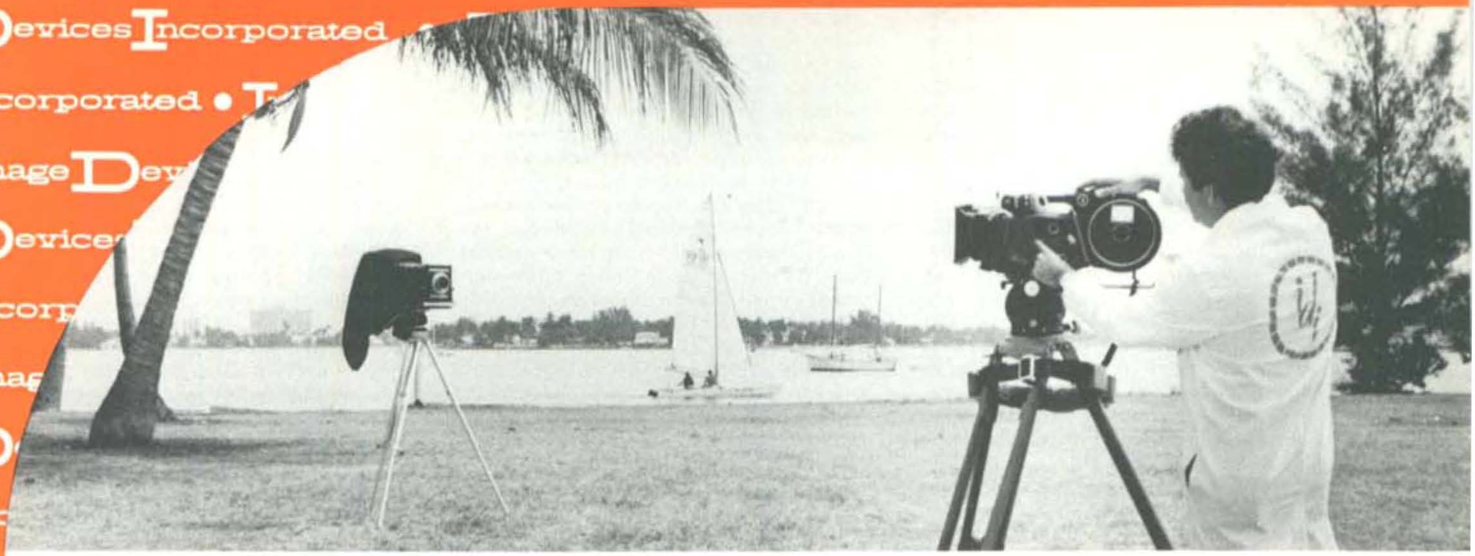

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Incorporated • Image Devices Incorporated • Image Devices Incorporated tioned by readers who are already utilizing electronic editing extensively in the assembly of programs recorded with film.

This book should be useful for reference purposes, and also to provide up-to-date information on a wide range of applications and techniques involving color photographic systems. The first two chapters deal with the physics of light and the biology of vision. The study of light describes what light is, how it is produced, propagated, reflected, refracted, transmitted and absorbed. The other science, the study of vision, is concerned with the way particular sensations are produced by particular light stimulii falling on the eye. In Chapters 2 and 3 the principles and practices of color densitometry and color sensitometry are described, with emphases on the cardinal rule that the conditions of measurement must simulate the conditions of use.

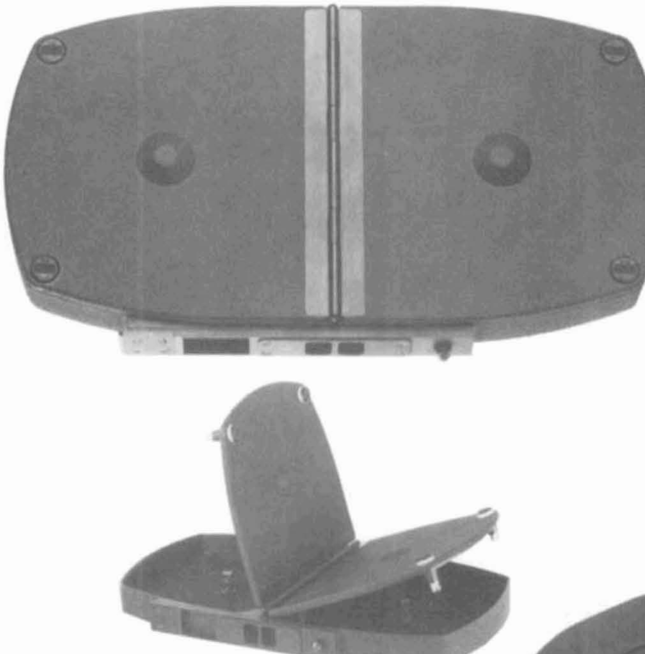
The chapter on Evaluating Image Structure utilizes the new concepts of communication and information theory in the study of film characteristics. A signal may be considered as any density or light transmittance variations that carry a well-defined message (or image) and noise is the random, meaningless variations in density or transmittance called grain. Once the information capacity of the film has been found the problems of relating it to how the film will be viewed (by the eye or some other device) or how it will reproduce in yet another step must be solved.

In the chapter on color reproduction in color television the various factors that control color rendition are reviewed. Many problems face the television engineer in optimizing the color rendition of the system. One major problem is shared with workers in other imaging technologies — the need to understand human color perception before the television system can be optimized. An idealized reproducing system is proposed which includes approximate compensation for color appearance changes occurring due to differences in the viewing situation between the original and the reproduction. Real systems can then be designed to approach a colorimetric match to the idealized system.

The chapter on color process quality control outlines conventional control methods as used in laboratory operations, utilizing photographic evaluation as the basic tool for control of the process. It is emphasized that no matter how carefully equipment is designed, chemistry formulated and variables controlled, it is absolutely necessary to actually process a sample of the product and observe the effect of the total system in practice. Ideally, any large operation should include an analytical department, capable of performing the quantitative chemical analyses required for the processes involved. It is pointed out, however, that chemical analysis is not as specific a science as would be desired in every case.

Chapters 14 and 15 describe work that is being done on the study of earth resources at the NASA/Goddard Space Flight Center and at the NASA Manned Spacecraft Center at Houston, Texas, utilizing photographic materials for data recording and analysis. At Goddard, the electronic images recorded by the spacecraft's sensors are converted into photographic pictures using an electron beam recorder. Each scene has seven photographic image records, one for each of the three RBV and four MSS spectral bands. The Skylab multispectral photographic facility has been designed to provide geometrically and photometrically calibrated imagery from space. An earth resources equipment package has been designed to collect remote sensing information throughout the electromagnetic spectrum from the visible to the radar wavelengths. The main purpose of the experiments is to acquire information to allow the development of resource survey techniques using photography in selected spectral bands.

The final four chapters of the book give the reader glimpses of the work now going on to develop color document copying techniques, with particular attention to rapid access systems for office copying. A sample color print made with the 3M Color-in-Color machine is included as a paste-in on page 404. This is a reproduction of an original watercolor made with a dry automatic process requiring only 30 seconds. — *Rodger J. Ross,* Consultant, 3 Orchard Ave., Cobourg, Ont., Canada.



Eclair people.

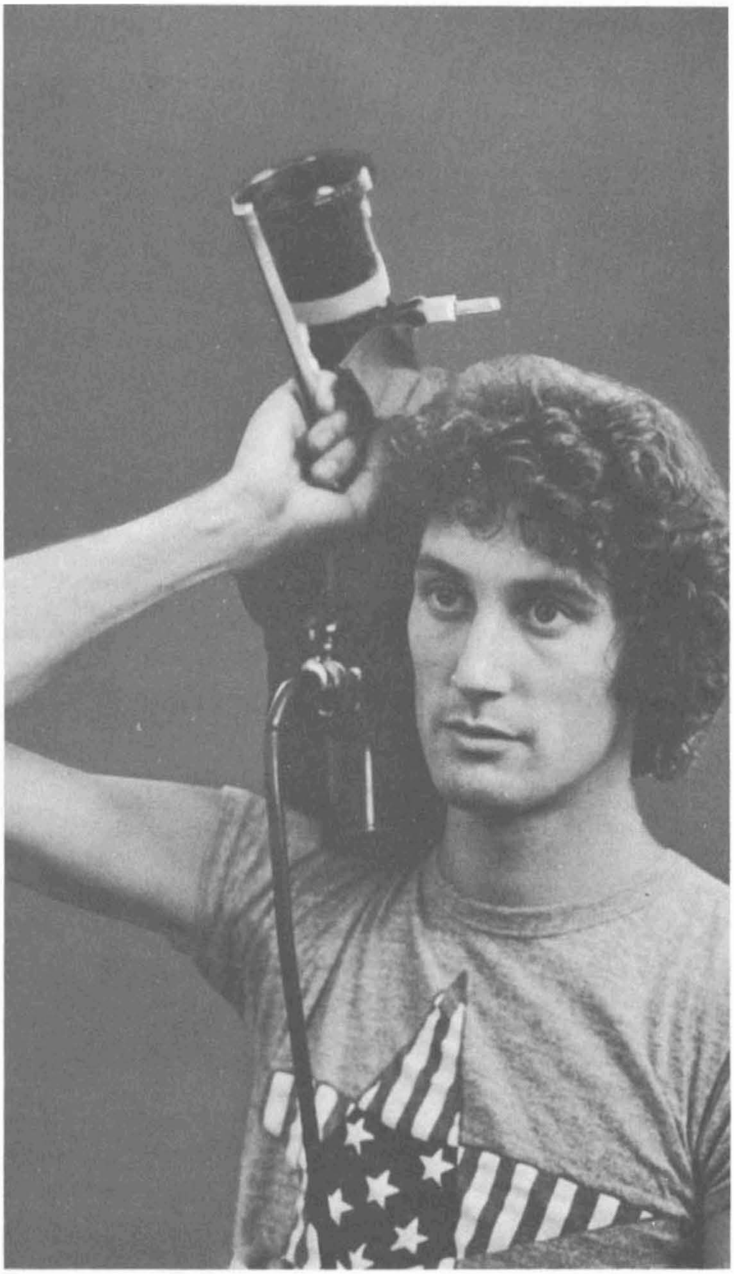
Meet Paul Goldsmith, noteworthy young filmmaker, Eclair user and director of photography for recent Cannes Film Festival award-winner "Jeremy." The first "theatrical" shot totally in 16mm—on a variety of locations, from jolting New York subway cars to motion picture soundstage, to candid shots in the midst of a high school in session. All with one camera. Ours.

"With Eclair, I get the total capabilities of a 'documentary' camera and a studio camera in *the same* camera. On location, my body and the camera's get along very well together. Its contours fit my contours; it balances well and all controls are easy and natural to operate quickly. So we could film with all the spontaneity of hand-held shots, without sacrificing steadiness.

"Themes and Variants"—about Arthur Penn—voted an Emmy. A Cine Eagle for "Dr. DeBakey." And work on major programs like American Dream Machine, Sesame Street, Black Journal and more.

"In the 'studio' part of *Jeremy*, our Eclairs gave us all the advantages we'd expect from larger studio models, but with more maneuverability. Shooting from cherry pickers and dollies, we were able to use all types of lenses—telephoto, zoom and ultra-fast. All told, some 70,000 feet of film was shot and processed without a hitch.

"If my experience is any indication, the day is past when young filmmakers must learn to use the bulkier studio cameras, with all their built-in limitations. Today, more and more filmmakers are finding newer, less restricting ways to express themselves. Thanks to innovators like Eclair, who help provide the means."



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