is reported to be flickerless and the direction of film travel can be instantaneously reversed. Model XR-35 is basically a wall projector to project the image on a conventional viewing screen. It can be converted to a film viewer by attaching the Model XR-11 rear-projection hood.

The Photo-Sonics 16mm-1P data recording pulse camera was announced by Instrumentation Marketing Corp.[82] The camera operates in pulse mode up to 10 pulses/s and in cine at 15 to 100 frames/s. Applications include time-lapse in traffic engineering, biomedical, microscopic, environmental and other studies. The basic unit consists of the camera body and a data box. A Julian calendar and data slate allow identification of each frame, by day of year, down to the second, automatically, plus manual handwritten data. Optional equipment includes 60-, 120- and 300-m (200-, 400- and 1200-ft) daylight-load magazines, Apex automatic exposure control and a selection of Schneider lenses.

A synchronous phase lock 16mm camera, a modification of the Photo-Sonics 16mm-1P intermittent pin-registered camera has been announced by Instrumentation Marketing Corp.[82] Daylight-loading magazines holding 60-, 120- or 300-m (200-, 400- or 1200-ft) films can be interchanged in a few seconds. The shutter is synchronized to an external signal and can also be phased. Operation is from $7\frac{1}{2}$ to 120 frames/s. Applications include industrial and medical cine x-ray photography and recording of video CRT displays.

The Photo-Sonics 16mm-1VN miniature high-speed camera has been announced by Instrumentation Marketing Corp.[82] Speeds are from 16 to 200 frames/s and pulse to 15 pulses/s. Features include intermittent pin-registration, daylight load 20-, 30- and 60-m (65-, 100- and 200-ft) magazines that can be interchanged in seconds. The film transport has two register and two pulldown pins. The operating voltage is 28-V dc, 1.6 A at 200 frames/s. The heater requires 28-V dc. The shutter is 120°. Interchangeable fixed shutters 9° to 72° are optional.

EDUCATION

Although the word "revolution" as applied to educational technology was disposed of in last year's Progress Committee Report in favor of "evolution,"[115] the word still crops up — for example, the Carnegie Commission on Higher Education's 1972 Report is entitled "The Fourth Revolution: Instructional Technology in Higher Education."[116]

Sterling M. McMurrin, Dean of the Graduate School of the University of Utah and a former U.S. Commissioner of Education, commented "It is difficult to carry on a successful revolution when most of those who are in the middle of it don't know a revolt is on. . . . They either don't know or won't admit that in the world of learning things are changing and that there are real possibilities for improving the quality and rate of learning through new methods of teaching. . . ."

It still seems that "evolution" is the better word to describe what is happening in the world of education. Revolution or evolution, the important thing is: what use is being made of the available equipments and devices? Also, how does the use of teaching machines and audio-visual aids affect the student learning process and how do they help to bring about the stated educational goals?

An article in the Winter 1972 issue of *AV Communication Review*, "The Effects of a Filmstrip/Tape Program on Teachers' Attitudes Toward Behaviorally Stated Objectives," by Earl P. Smith, asks ". . . will a filmstrip/tape change teachers' attitudes and if so will the change be related to personality types and/or subject matter taught?" It seems fairly obvious that the relationship of teacher-student-machine has not yet been thoroughly explored.

There is also another area where verbal accuracy is desirable. As pointed out in "The SMPTE and Education" in the September 1972 issue of the *Journal*,[117] the terms "training" and "education" are not necessarily interchangeable. The rapid changes in technology within the industry are reflected in the number of training programs offered to enable workers on all levels and specialists in many disciplines to learn how to use the new machines and the new techniques and how to adjust to new approaches. One can hardly pick up a professional journal without finding references to new uses of the changing technology. Both industry and education are making increased use of cassettes, using both tape and film, for specific learning situations; also, the number of closed-circuit TV installations seems to be increasing. Many individuals predict that CATV will become a significant force in this direction in the near future.

Industry has come to accept the fact that individual instruction at the point of need is probably the most cost effective. The academic community has been somewhat slower to accept this premise, probably due to tradition and to the fact that the investments must be amortized over a much longer period of time. There is no question, however, that we can no longer afford the luxury of small classes in situations where mediated individual or large group presentations can do the same job as well or better.

The many training programs offered by industrial organizations as well as by many colleges and universities are necessary and desirable. Many training programs, some under the name of "workshops" are offered as part of a broad educational program.

The education of a student, for example in filmmaking, may cover a vast field. As pointed out in "The SMPTE and Education," "It is more accurate to think of education as more general (than training), i.e., learning from the past and relating it to the present and future.

The increasing development of teaching machines and audio-visual equipments used for the classroom is a healthy trend, in spite of some dubious results and setbacks. It is the writer's opinion, that the increasing number of young people seeking training (and education) for careers in motion-pictures and television and related sciences, arts and technologies also is a healthy trend.

As an outgrowth of earlier studies such as the McMurrin Report,[118] efforts are being increased for more governmental assistance for instructional technology. On 11 September 1972, Representative Hansen of Idaho introduced H.R. 16572 in Congress to establish a Council on Educational Technology.[119] It is hoped that efforts such as this will provide assistance as well as incentive toward increasing the pace of evolution.

As has been noted in another context, in addition to the Society's responsibilities in the field of education related to the training of individuals, we have a major responsibility to assist in the development of standards for the equipment and systems used in education and training programs.

The writer was recently appointed U.S. Technical Advisor to the U.S. National Committee of the International Electrotechnical Commission for IEC/SC60C. This committee is concerned with the creation, promotion and adaption of international standards for educational equipment and systems involving the recording, copying and reproduction of audio and visual information in the educational field. An advisory committee through the U.S. Technical Advisor and the U.S. National Committee has the responsibility of insuring that requirements of both education and industry in the United States are considered in related international standardization activity. As the Society's Vice-President for Educational Affairs,

the writer also represents the Society on the Educational Media Council which, among its many interests, is vitally concerned with standards for educational equipment and systems. — *Herbert E. Farmer*, Vice-President for Educational Affairs

Equipments

Among new teaching systems showing a trend toward equipments developed to meet specific educational needs is the Norelco PIP Audio and Visual Cassette System. The PIP (Programed Individual Presentation)[120] is an electronically actuated multimedia projection system that combines synchronized sound from an audio cassette with the visual impact of motion pictures, slides, filmstrips, animation, pop-ons and other techniques on a separate super-8 cassette in a single projection unit.

PLATO (Programed Logic for Automatic Teaching Operations), developed at the Coordinated Science Laboratory, University of Illinois, Urbana, Ill., to explore the possibilities of automation in individual instruction[121] is expected to be used in the operation of some 4,000 student stations by the end of 1975.[122]

Since more than 500 manufacturers of audio-visual equipment are listed in the *1972–73 Audio-Visual Equipment Directory* published by the National Audio-Visual Assn.,[123] it is obvious that educational technology is an important segment of this country's economy.

Courses and Workshops in Film and Television

A course, The Modern Motion-Picture Laboratory — Technology and Techniques, was offered in the spring of 1972 by the University of Southern California Div. of Cinema in cooperation with the Hollywood Section of the SMPTE.[124] The course was planned specifically for laboratory and production personnel who need advanced information about laboratory procedures.

In the fall semester, USC's Div. of Cinema and the SMPTE offered a new course, The Production Team — Motion Pictures and Television.[125] It was planned to give management and production personnel, historians and students of the media an insight into the complexities of the varied forms of production.

USC's Div. of Cinema also conducted a summer program, jointly with Universal Studios.[126] The program included a seminar in Motion Picture Business, an 8mm Film Workshop (with each student required to make films) and a course in the History of Motion Pictures. The course was so successful that it is being repeated in 1973.

Among other interesting educational events was a Workshop in Holography offered by the Motion Picture Dept. of Columbia College in Chicago.[126]

The 14th annual MPL Motion-Picture Seminar cosponsored by Motion-Picture Laboratories, Inc., and the SMPTE Nashville Section was held at Memphis State University in Memphis, Tenn.[128]

New York University's School of Continuing Education held film and videotape workshops during the summer of 1972.[128]

Cinema Institute, a training school for professional filmmakers sponsored by Expression Foundation in association with American Film Institute was held during the summer of 1972.[128]

One of the more important seminars sponsored by industrial organizations is the Videofilm Seminar, developed by Eastman Kodak Co.'s Motion-Picture and Education Markets Div., which was held in the months of January, February, March and April 1972.[129] Rodger J. Ross was the instructor for the program, which was intended for television executives, cameramen and anyone who works with film for television. Mr. Ross described the overall goal of the seminar as the improvement in the quality of film production to meet technical broadcast requirements.

Other events included the opening of the Norman Topping Instructional Television Center on the USC Campus on January 26, 1972.[130]

The American Film Institute announced a grant of $40,000 establishing a new national confederation of film teachers groups called the National Assn. of Media Educators.[131] Sixteen regional groups composed of some 3,500 film educators are represented in the new organization.

Scholarship Programs

The Scholarship Committee selected two recipients for the SMPTE Scholarships and four recipients for the Academy-SMPTE Scholarships.[132] The Scholarship Program was established in 1971 to facilitate research in the sciences related to the production of motion pictures.

Publications

The American Film Institute's *Guide to College Courses in Film and Television*,[133] published yearly, is, quite likely, the most informative directory of its kind. The 1973 edition lists 613 colleges, universities and two-year colleges in the United States offering courses in film and television — 186 more schools than were listed in the 1971 *Guide*. The *Guide* also notes that, according to the statistical survey upon which the report is based, 22,466 students are presently working toward degrees in film, television or related areas.

The Hope Reports are known throughout the industry as perhaps the most authoritative guide available to the entire field of audio-visual communications. *AV-USA 1972*,[134] in the Hope Reports series, noted that audio-visual communications spending passed the $1.9 billion mark in 1971.

Rodger J. Ross described the series of five-day videofilm seminars which he conducted at Eastman Kodak's Riverwood Marketing Education Center near Rochester in a paper in the January 1972 issue of the *Journal*.[135]

Other *Journal* papers on subjects having to do with education include "A variable-speed audio-visual cassette system" by Edward D. Baars (October 1972, pp. 789–791); and "A pilot videocassette for education: development and design" by Stanley C. Gabor (September 1972, pp. 687–689); and "The SMPTE and education" by Herbert E. Farmer (September 1972, pp. 684–686).

Richard R. Ball and James E. Reedy outlined the information in *A Survey of Motion Picture, Still Photography, and Graphic Arts Instruction* (published by Eastman Kodak Co.) in "A published survey of photographic instruction" in the September 1972 *Journal* (pp. 689–690).

An informal and unofficial report on the first meeting of Subcommittee SC60C (Educational and Training Equipment) of IEC Technical Committee 60 was prepared for the *Journal* by Raymond Wyman, Chairman of the new Subcommittee.[136]

In December the Educational Media Council announced publication of *Standards and the Educational Consumer*,[137] the report of a meeting held in Washington in November 1971 where some 70 qualified and concerned representatives of education and industry met to discuss the problems and to look for viable solutions. The eight position papers are included along with the discussion and conclusions.